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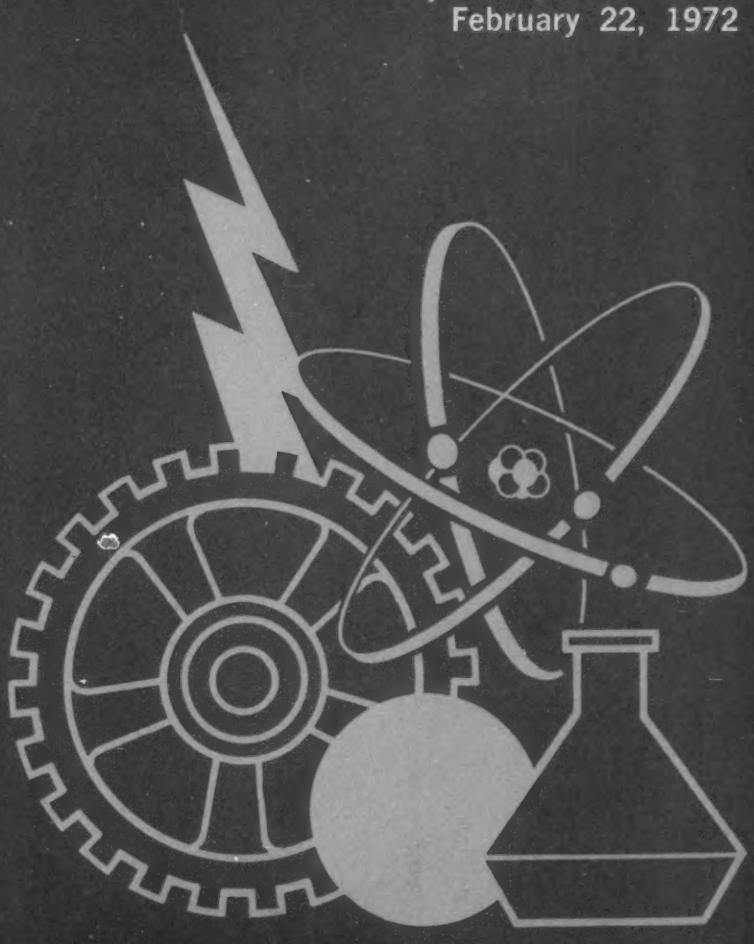

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February 22, 1972 Volume 899 Number 4

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# U. S. DEPARTMENT OF COMMERCE
## UNITED STATES PATENT OFFICE
## TRADEMARK REGISTRATION TREATY

*The World Intellectual Property Organization (WIPO) released on January 31, 1972 in Geneva, Switzerland, a draft of a proposed Trademark Registration Treaty designed to facilitate the international protection of trademarks. This draft Treaty is reproduced below together with the draft Regulations and some of the explanatory materials released by WIPO.*

*The United States has been invited to send a delegation to participate in the discussions of a Committee of Experts scheduled in Geneva from May 2 to 8, 1972, to consider the draft Treaty.*

*These documents are published by the Patent Office at this time so that interested parties will have an opportunity to consider them and offer comments prior to the May meeting. Interested parties should submit their views or suggestions to the Commissioner of Patents, Washington, D.C., 20231 by April 14, 1972.*

ROBERT GOTTSCHALK,
*Commissioner of Patents.*

*Jan. 31, 1972.*

## INTRODUCTORY MEMORANDUM [TRT/11/3]
## TO THE JANUARY 31, 1972, DRAFT OF THE TRADEMARK REGISTRATION TREATY

(prepared by the International Bureau)

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### INTRODUCTION

1. This document, like all the other documents in the TRT/II series, has been prepared by the International Bureau of WIPO for the second session of the "Committee of Experts on the International Registration of Marks," convened for May 2 to 8, 1972, in Geneva. The decision to convene the Committee was made by the Executive Committee of the International (Paris) Union for the Protection of Industrial Property when it met in September/October 1971.

2. The said documents are based on the conclusions of the first session of the said Committee of Experts (hereinafter referred to as "the 1971 Committee of Experts"). It met at Geneva in October 1971.

3. The member States of the Paris Union and 15 intergovernmental and 24 nongovernmental organizations, primarily representing trademark owners (particularly private industry), trademark lawyers and trademark agents, were invited. The following were represented:

(a) States: Algeria, Australia, Austria, Belgium, Brazil, Cameroon, Canada, Cuba, Czechoslovakia, Denmark, Egypt, Finland, France, Germany (Federal Republic), Hungary, Iran, Italy, Ivory Coast, Japan, Mexico, Monaco, Netherlands, Norway, People's Republic of the Congo, Poland, Portugal, Romania, South Africa, Soviet Union, Spain, Sweden, Switzerland, Syria, United Kingdom, United States of America, Yugoslavia (36).

(b) Intergovernmental Organizations: United Nations, United Nations Conference on Trade and Development, Benelux Trademark Office, Commission of the European Communities, African and Malagasy Industrial Property Office (5).

(c) Non-governmental Organizations: American Bar Association (ABA), American Patent Law Association (APLA), Association of Corporate Patent Counsel, Bundesverband der Deutschen Industrie (BDI), Chartered Institute of Patent Agents, Council of European Industrial Federations (CEIF), Deutsche Vereinigung für Gewerblichen Rechtsschutz und Urheberrecht, European Federation of Agents of Industry in Industrial Property (FEMIPI), Institute of Trade Mark Agents, International Association for the Protection of Industrial Property (AIPPI), International Chamber of Commerce (ICC), International Federation of Agricultural Producers, International Federation of Patent Agents (FICPI), New York Patent Law Association (NYPLA), Trade Marks, Patents and Designs Federation (TMPDF), Union des Fabricants, Union of European Patent Agents (UNEPA), Union of Industries of the European Communities (UNICE), United States Trademark Association (USTA) (19).

4. Experts of intergovernmental and non-governmental organizations had the same opportunities to participate in the discussions as governmental experts.

5. The conclusions of the 1971 Committee of Experts are reflected in the report of that Committee (document TRT/I/11).

6. The second (May 1972) session of the Committee of Experts is being convened to examine the Second Draft of a treaty, tentatively called "the Trademark Registration Treaty," and the Second Draft of the Regulations to accompany the Draft Treaty (documents TRT/II/1 and 2), as well as other documents issued or to be issued in the TRT/II series of documents. The document containing the Second Draft Treaty also contains comments on each provision of that Draft. They are mainly intended to explain the reasons for certain solutions and to facilitate the reader's task of relating the Draft Treaty to the Draft Regulations.

7. The rest of this document is divided into three parts. Part I gives a brief summary of the Draft Treaty. Part II enumerates some of the main advantages expected from an international registration system of marks as proposed in the Draft Treaty. Part III analyzes the questions concerning the coexistence of the proposed new Treaty with the existing Madrid Agreement.

8. It is to be noted that, the purpose of this document being to give concise information, many details—frequently quite important—had to be omitted. Only documents TRT/II/1 and 2 are to be considered as fully reflecting the proposals.

### PART I: BRIEF SUMMARY OF THE DRAFT TREATY

9. *National Registration Effect of International Registrations.* The most important feature of the Draft Treaty,

the provision which constitutes its *raison d'être*, is that marks—and by this term both trademarks and service marks are meant—could be registered internationally, that is, with the International Bureau of the World Intellectual Property Organization (WIPO), and that international registration would have in each of the Contracting States (that is, States party to the Treaty) in which the owner of the mark desires protection the same effect as if the mark had been registered in each and every one of such States.

10. A corollary of this "national registration effect," as important as the effect itself, is that international registrations could be renewed every ten years, and such renewals would maintain the national registration effect in each and every one of such States for the periods for which the international renewal was effected.

11. *International Application.* To achieve protection by international registration of a mark, the owner would file an international application. Only residents and nationals of Contracting States would have the right to file international applications. The international application would identify the applicant, the mark, the goods and/or services in connection with which protection of the mark is desired, and the States ("designated States") in which protection is desired.

12. The goods and/or services would be listed and grouped according to the classes of the International ("Nice") Classification. That Classification had 34 classes for goods, and 8 classes for services. It is used by the national Offices of some 60 countries at the present time.

13. Any Contracting State, including the applicant's own, could be designated. Any number of Contracting States could be designated.

14. A representative may be appointed in the international application for contacts with the International Bureau.

15. The international application could be filed in either English or French. Preparation of the international application could essentially consist in filling in a printed form, distributed free of charge by the International Bureau. Listing the goods and/or services is facilitated by an alphabetical list of practically all conceivable goods and services which accompanies the International Classification of Nice. The said alphabetical list contains the names of some 20,000 products (goods) and services and is available in English, French, German and Spanish—and will soon be available also in Dutch, Italian and Portuguese—in official editions published by the International Bureau. The alphabetical list indicates, by its number, the class to which each product or service belongs and is brought up to date from time to time to cover goods or services which are new.

16. The international application would be subject to the payment of a fee. Part of the fee would be kept by the International Bureau to cover its expenses connected with the publication of the international registration and other processing of the international application. The other part of the fee would belong to the national Offices of the designated Contracting States to cover their expenses connected with the processing of the international registration notified to them by the International Bureau. The amount of the fees payable would depend on the number of the designated States and the number of classes of goods and/or services listed.

17. The International Bureau would check each international application to see whether it complied with the most elementary requirements of any application: Is the applicant sufficiently identified? Is he, on the basis of his nationality or residence indicated by him, entitled to file international applications? Is the reproduction of the mark included? Are goods and/or services listed? Is there at least one State designated? Have the fees been paid? Is the application in one of the prescribed languages (English, French)? Is it signed?

18. It is difficult to image that the International Bureau would err in answering such elementary questions. However, if it did, the applicant could turn to the national Office of one or more of the designated States. Each such Office could request the International Bureau to proceed with the international registration as far as that State is concerned if it found that the International Bureau had erred. The International Bureau would proceed according to the request.

19. *Later Designations.* Any Contracting State not designated in the international application itself could be designated later. This faculty is important because the applicant or owner might have no interest in a given State when he filed but develop an interest in the same State later and also because a State might not have been a Contracting State when the international application was filed.

20. *Registration, Publication, and Notification.* Unless the international application is declined because of some formal defect, the mark would be registered in the International Register of Marks and all the relevant data—including the reproduction of the mark and the list of goods and/or services—would be promptly published and individually notified to the national Office responsible for the national registration of marks in each of the designated States.

21. The international registration would normally be effected within a few days after receipt of the international application. The international registration date would be the date on which the International Bureau had received the international application. This rule would be subject to an exception when the application contained some serious mistake: in such a case the international registration date would be the date on which the mistake is corrected. (Any mistake could be corrected within six months.)

22. The international publication would be made in a weekly gazette of the International Bureau.

23. The individual notifications could not be different from the contents of the publication because they would consist of reprints of the relevant parts of the gazette.

24. The above remarks also hold as far as later designations are concerned.

25. *Refusal of National Registration Effect.* Each designated State could, as far as it is concerned, refuse the national registration effect on the same grounds as those on which it could refuse an application filed with its national Office for registration in the national register of marks. However, grounds incompatible with the Treaty or with the Paris Convention would be excluded. For example, no designated State could require that the application be translated into its national language or that fees other than its share in the international fees be paid to it.

26. Any such refusal would, however, have to be pronounced, or its possible pronouncement announced ("notice of possible refusal")—for example, where the registration has been opposed by a third party and the refusal depends on whether the opposition will be successful—before the expiration of a certain time limit. As to the length of the time limit, the Draft Treaty contains alternatives, 12 or 15 months, counted from the date of the international publication of the international registration, or of the later designation, as the case may be.

27. Furthermore, the refusal or notice of possible refusal would have to contain the reasons for the refusal or possible refusal. Although the final decision could be rendered after the expiration of the 12 or 15 months period, it would be effective only if it contained and was based on at least one of the reasons indicated in the notice of the possible refusal. According to a possible vari-

ant, this condition would not apply where the decision was that of a court.

28. *Use of the Mark.* No designated State could refuse the registration effect, cancel it or otherwise impair the rights of the owner on the ground that he had not used his mark before the expiration of a certain period of time counted from the date of the international registration (or the later designation, as the case may be). As to the length of the period, there are two variants: three or five years. No such moratorium on use is, however, required if the mark's international registration was preceded by a national registration or another international registration three (or five) years older than the international registration, and the term of this moratorium may be correspondingly reduced where the mark's international registration was preceded by a national registration or another international registration which is less than three (or five) years older than the international registration.

29. It is to be noted that the national law of any Contracting State could provide that any action for infringement by the owner of the international registration and based upon such registration may not be brought until the said owner has started using the mark in the said State and may remedy therefrom may relate only to the period of such use.

30. *Declaration of Actual Use.* Routine declarations of actual use could be filed with the International Bureau in the form prescribed by the national law of the State which requires such declarations. According to a possible variant, the declaration could also be filed on an internationally agreed form.

31. *Declaration of Intent To Use.* Declarations of intent to use connected with any designation and filed with the International Bureau would have the same effects as declarations of intent to use connected with national applications and filed with national Offices.

32. *Preservation of Acquired Rights.* Whenever the owner of a national registration switches over to international registration, his rights acquired under the national registration would not be affected and would also be deemed to be included in the international registration. The same would apply to switching over from international registration under the Madrid Agreement to international registration under the new Treaty.

33. *Right of Priority.* International applications could invoke the priority of earlier national applications, and vice versa. In the former case, the single declaration of priority, made in the international application, would apply to all designated States.

34. *Assignments.* Although their substantive validity would be subject to the national law of each State, assignments and other changes in ownership with respect to some or all of the designated States, or concerning some or all of the goods and/or services listed, could be recorded in the International Register of Marks.

35. *"Union."* The Contracting States would constitute a Union with an Assembly and a Secretariat, the latter being provided by the International Bureau. The Assembly could amend the Regulations subject to a ⅗, and, in some cases, ¾ majority vote.

36. *Financial Obligations of Contracting States.* Except for the possibility of having to contribute towards a working capital fund, the Contracting States would not incur any financial obligations and would not have to pay any contributions.

37. *Becoming Party to the Treaty.* Only States members of the Paris Union could become party to the Treaty. Any State could make its acceptance of the Treaty conditional on the acceptance of the Treaty by one, one of two, or two other States specified by it.

38. *Regulations.* The Regulations would be attached to the Treaty. Both instruments would have to be adopted by a diplomatic conference. Such conference is scheduled for May 7 to June 2, 1973, in Vienna.

## PART II: MAIN ADVANTAGES

39. *Complexity of the Present System.* Today, the owner of a mark who wishes to secure protection of a mark in several States must—unless he can avail himself of the benefits of the Madrid Agreement and the said States are party to that Agreement—separately register the mark in each of those States. The number of such States may be very high. More than 50 is not unusual. The burden placed on the owner is consequently a heavy one: preparation of a separate application for each State; translation into the various languages of those States; filing separately in each of them; being familiar with their widely varying requirements, in particular with their fee structures; keeping an eye on as many different due dates for renewal as there are States in which he wishes protection; transfer of money in as many different currencies as there are such States; uncertainty as to whether he is aware of the latest requirements and the latest fee schedules; uncertainty as to whether the money he transfers to persons or authorities in so many States will arrive in time and will really be applied to the mark he wishes it to be applied to.

40. *Administrative Simplicity Under the Treaty.* Under the Draft Treaty, these difficulties would almost entirely disappear. There would be only one application; no translation, or only one, would be needed; that translation would mainly relate to the list of goods and/or services and would be easy to make on the basis of the official English and French lists of the International Classification; the amount of the fees payable would be easy to compute on the basis of a single schedule of fees; filing would be in one place (with the International Bureau); renewals would be in one place (the same Bureau); only one date repeated once every ten years would have to be remembered for renewal purposes; all fees would be paid in one currency (the Swiss), by a simple transfer, to an agency experienced in currency transfers; it would suffice to know the Treaty and its Regulations—rather than a great number of different national laws—in order to be sure that the application is correct and the renewal is correct.

41. *Shortening of Period of Uncertainty.* The fact that the Treaty would oblige each designated Office to notify refusals or notices of possible refusals within a period of 12 (or 15) months would reduce the period of uncertainty prevailing without the Treaty as to the ultimate fate of applications in some of the States. Under the Treaty, the applicant would know, once the said period was over, whether he had acquired the national registration effect or, if there was still no final decision, the obstacles it would be necessary to overcome in order to secure that effect.

42. *Declarations of Intent To Use and Routine Declarations of Actual Use.* Such declarations are required in a number of States. Under the Treaty, they could be filed with the International Bureau.

43. *Requirement of Using the Mark.* Laws vary greatly from one another on the question whether the owner of the mark loses his rights because of non-use, particularly during the period around the initial registration. The Treaty would not create uniformity in this respect but it would guarantee to the owner that non-use before, at the time of, or during the first three (or five?) years after the international registration could not result in refusal or cancellation of his mark.

44. *Comparison With the System of the Madrid Agreement.* Most of the advantages mentioned in connection with applications and renewals exist also under the Madrid

Agreement. But that Agreement also contains disadvantages. The most important of them is that any international application must be preceded by registration of the marks in the national register of marks of the country of origin of the mark. This may be impossible for reasons peculiar to the national law of that country or because of anticipations existing only in that country. Furthermore, the procedure leading to registration in the country of origin may last for a long time, and may even take years, causing the loss of any priority right and, in countries whose laws follow the principle "the-earlier-registrant-has-the-stronger-right," even the loss of all rights. All these disadvantages would not exist under the Draft Treaty since, in the proposed system, international applications would be filed direct with the International Bureau and the existence of a registration in the country of origin would not be required.

45. None of the advantages mentioned in connection with the three-year (or five-year) moratorium on the requirement to use the mark, the declarations of intent to use, and the routine declarations of actual use, exists under the Madrid Agreement.

46. The Madrid Agreement provides that the cancellation of the national registration of the mark in its country of origin, if effected during the first five years of the international registration or based on an action commenced during that period, nullifies the international registration in all countries. The new Treaty would contain no such provision granting extraterritorial effect to a national decision. This might be regarded as a disadvantage for any person wanting to cancel the international registration of a mark since, instead of instituting one proceeding in the country of origin, he will have to institute a separate proceeding in every State where he wishes the mark to be cancelled. However, the non-inclusion of this system in the Treaty would save the owner of the international registration from what, in many cases, would be a manifest and grave injustice, namely, the loss of his rights in a number of countries on the basis of a decision taken according to the law of a country which may be quite different from the laws of those countries and on the basis of a factual situation which may be quite different from the factual situation prevailing in those countries.

## PART III: COEXISTENCE WITH THE MADRID AGREEMENT

47. *New Treaty or Revision?* The Draft Treaty is presented in the form of an instrument independent of the existing Madrid Agreement. The Madrid Union has 22 members—or 21 if the German Democratic Republic is not counted as a member (since its membership is contested): Austria, Belgium, Czechoslovakia, Egypt, France, Federal Republic of Germany, German Democratic Republic, Hungary, Italy, Liechtenstein, Luxembourg, Monaco, Morocco, Netherlands, Portugal, Republic of Viet-Nam, Romania, San Marino, Spain, Switzerland, Tunisia, Yugoslavia.

48. The Draft Treaty could, with only small drafting changes, be transformed into a revision of the Madrid Agreement. The 1971 Committee of Experts did not ask for such a transformation, probably for the reasons which were put before it in detail (see document TRT/I/2, paragraphs 48 to 52) and which may be very briefly summarized as follows:

(a) The differences between the Draft Treaty and the Madrid Agreement are so substantial—direct filing as opposed to filing on the basis of a registration in the country of origin, different terms for the initial registration, different terms for renewal, different fee systems, two official languages as opposed to one, the absence of all extraterritorial effect as opposed to extraterritorial effect of cancellation of the national registration in the country of origin—that even if the new instrument were called a revision of the Madrid Agreement, it would, *for all practical purposes*, be an independent treaty. This is the more so as their administrations could not be merged: not only would the applicants, owners, national Offices and the International Bureau have to follow rules fundamentally different but also the budgets and finances could not be merged because the fee systems are different and, above all, because the States party to one instrument would not be the same as those party to the other.

(b) The main purpose in proposing a new system is to find solutions acceptable both to the members of the Madrid Union and to countries which, without the substantial changes proposed, cannot accept the Madrid Agreement. *These prospective new members*, however, could vote in the diplomatic conference and could sign the new instrument—that is, could become responsible co-authors of the new system—only if the new instrument were a treaty independent of the Madrid Agreement. If it were a revision, only the existing members could participate in the decisions and sign the revised Agreement.

49. Two questions might deserve examination in connection with the proposal to have two independent instruments (Madrid Agreement and the new Treaty): What are the advantages and disadvantages of such a solution? Is there any need to establish links between the two instruments?

50. *Advantages and Disadvantages.* The quetion of advantages and disadvantages will be considered from the viewpoint of the territorial extension of an international registration system, the owners of marks, and national Offices.

51. It follows from what has been said about negotiation and signature in paragraph 46(b), above, that, in order to increase substantially the number of countries adhering to an international registration system, the only safe solution is to have an independent treaty. In other words, this is a matter of political necessity.

52. As far as the owners of marks are concerned, one must recognize that knowing two systems (Madrid and the new one) is more difficult than one. However, knowing two systems is still infinitely easier than knowing as many systems as there are countries outside the Madrid Union: once it is recognized—and in view of the history and present status of the Madrid Union one must recognize—that the Madrid system is not viable in a great number of countries, it is clear that it will be an enormous advantage to have a uniform international (the new) system for at least the countries outside the Madrid Union plus certainly the majority of the countries party to the present Madrid system.

53. As far as the national Offices are concerned, some say that, where a country belongs to two systems, its national Office will have two kinds of duties to perform and this will cause complications. However, this is only a superficial impression because the fact is that, for all practical purposes, the proposed new system will simply liberate national Offices from some tasks which they have to perform under the Madrid Agreement. Those are the tasks of certifying and transmitting to the International Bureau the international applications and the fees accompanying them, tasks which involve great responsibility because errors or delays may deprive the owner of the mark of his rights in all the countries in which he has sought protection. Under the new Treaty, national Offices would have no such tasks (because of the filing of the international applications direct with the International Bureau) and the remaining tasks (mainly the notification of refusals or notices of possible refusal) would be substantially if not entirely the same under the two systems. In other words, the net result of the existence of the

second system for national Offices would be to lessen considerably, rather than complicate, their responsibilities.

54. *Links.* As far as the question whether some links need be established between the existing (Madrid) system and the new system is concerned, it would seem that there is no need for such links. On the contrary, the absence of any links, that is, the fact of keeping the two systems entirely apart, would make matters easier to comprehend and to apply.

55. Having two systems may, in some cases, present some advantages to the owner of the mark because he may choose between two possibilities according to whichever he considers the more advantageous for him. For example, take the case where he is a resident of a country which is party to both the Madrid Agreement and the new Treaty. If he desires protection in any other country which is also a party to both instruments, he will have the possibility of deciding which route to follow: if he already has a secure home registration and is not afraid of a cancellation with extraterritorial effect, if the fees are less under the Madrid Agreement, if he needs no moratorium for starting the actual use of the mark, if he is confident that he does not need a period of grace for paying certain fees, if, in fact, any of these reasons applies, he would probably choose "the Madrid route"; on the other hand, if he is excluded from obtaining a registration in his own country or cannot afford the time necessary for acquiring one, if he dislikes the idea of exposing his mark to a cancellation with extraterritorial effect, if the fees are less under the new Treaty, if he does not use the mark and wishes to secure protection in States which require actual use on filing or before the end of the third (or fifth) year after filing, if it is indifferent to him whether he lists his goods and/or services in French or English or if he actually prefers to do so in English, if he thinks that he might make a mistake in calculating the fees and wants to be able to use any period of grace, if, in fact, any of these reasons applies, he would probably choose "the new route."

56. It is to be noted that, naturally, all the questions relating to the coexistence of two intstruments should be considered transitory. Any country acceding to the new Treaty might decide to leave the Madrid Union. If all such countries did so, the Madrid Union would automatically disappear for lack of members. Of course, it is hoped that the present members of the Madrid Union would not, upon accession to the new Treaty, leave the Madrid Union, although, even if they did, they would not harm their residents or nationals in countries which did likewise because the owner can switch over to the new system without loss of rights: they could harm them only in those countries which are party only to the Madrid Agreement.

57. The following would be a completely safe solution: any member State of the Madrid Union acceding to the new treaty should leave that union only when its nationals and residents cease to use the Madrid Agreement. This would probably be the case when all, or almost all, the present members of the Madrid Union had acceded to the new Treaty.

58. In the meantime, owners of marks seeking protection in countries party to all three instruments could choose not only between the existing two routes—the Paris Convention route and the Madrid route—but from among three routes: the Paris route, the Madrid route and the new route. Far from harming them, this wider choice could only be advantageous to the owners of marks.

## DRAFT

## TRADEMARK REGISTRATION TREATY [TRT/11/1]

(prepared by the International Bureau)

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COMMENTS ON THE TITLE OF THE TREATY

The title proposed is "Trademark Registration Treaty."

It is admitted that this title could be objected to on at least two grounds: first, that it uses the word "trademark" instead of "mark" and, second, that it does not specify that the registration in question is an international registration.

To the first objection, one could reply that, in the English language, the first meaning of the word "mark" is *not* "trademark." Thus "mark" could lead to misunderstandings. That is why it is proposed to use in the title the term "trademark"—which is unequivocal. The *text* itself uses the word "mark" to convey, to the specialist, the assurance that service marks have not been forgotten.

To the second objection, one could reply that, a treaty being an international matter *par excellence*, the word "Treaty" in the title already conveys the idea that the registration must be of some international kind. Here, too, it is of course true that the text uses the expression "international registration," but for a good reason, namely, to distinguish it from national registration. In the title, that distinction follows, as has been stated, from the juxtaposition of the words "Registration" and "Treaty."

Thus, the title—even if not quite in conformity with the terminology of the text—is believed to convey the essence of its subject matter and to be understandable also to the non-specialist.

Furthermore, it has the obvious advantage of being brief.

Finally, it has the advantage that its initials—TRT—give an abbreviated title which is easy to pronounce and easy to memorize.

**Trademark Registration Treaty**

(Second Draft)

## INTRODUCTORY PROVISIONS

### ARTICLE 1

*Establishment of a Union*

The States party to this Treaty (hereinafter called "the Contracting States") constitute a Union for the international registration of marks.

COMMENTS ON ARTICLE 1

*Sole paragraph:* The Treaty would be a "special agreement" under Article 19 of the Paris Convention since it would be concluded among States party to that Convention (see Article 108(1) of the Draft Treaty). Article 19 of the Paris Convention reads as follows: "It is understood that the countries of the [Paris] Union reserve the right to make separately between themselves special agreements for the protection of industrial property, in so far as these agreements do not contravene the provisions of this [Paris] Convention."

Each of the seven agreements so far concluded under Article 19 of the Paris Convention, which provides also for the establishment of administrative organs (at least an Assembly of the Contracting States), provides for the constitution of a special "Union" under the "general" Paris Union (constituted by the Contracting States of the Paris Convention). Thus, the constitution of a Union is in conformity with tradition.

### ARTICLE 2

*Abbreviated Expressions*

For the purposes of this Treaty and the Regulations and unless expressly stated otherwise:

(i) "international registration" means a registration effected under this Treaty by the International Bureau in the International Register of Marks;

(ii) "international application" means an application filed for international registration;

(iii) "applicant" means the natural person who or legal entity which files the international application;

(iv) "owner of the international registration" means the natural person or the legal entity in whose name the international registration stands in respect of some or all of the designated States or some or all of the goods and/or services listed in that registration;

(v) "joint owners of the international registration" means those natural persons or legal entities in whose names the international registration stands for the purposes of the same designated States and the same goods and/or services;

(vi) "mark" means both a trademark and a service mark;

(vii) "regional mark" means a mark registered by an intergovernmental authority other than the International Bureau having the power to grant registrations with effect in more than one State;

(viii) references to any *final* decision or *final* refusal shall be construed as references to a decision or refusal against which there is no remedy, or against which all remedies have been exhausted, or where the time limit for asking for a remedy against the refusal or decision has expired;

(ix) references to any *publication by the International Bureau* shall be construed as references to publications effected in the official Gazette of that Bureau.

(x) references to the *date of the publication* of the international registration or of the recording of the later designation shall be construed as references to the date of that issue of the official Gazette of the International Bureau in which the international registration or the recording of the later designation, as the case may be, has been published;

(xi) references to any *recording by the International Bureau* shall be construed as references to recordings made in the International Register of Marks;

(xii) "designated State" means any Contracting State in which the applicant or the owner of the international registration desires that such registration produce the effects provided for in this Treaty and which has been identified for that purpose in the international application or any request for the recording of later designation;

(xiii) "national Office" means the government authority of a Contracting State entrusted with the registration of marks; references to a *national Office* shall be construed as referring also to any intergovernmental authority which several States have entrusted with the task of registering regional marks, provided that at least one of those States is a Contracting State, and provided that such authority has been empowered to assume the obligations and exercise the powers which this Treaty and the Regulations provide for in respect of natural Offices;

(xiv) "national register of marks" means the register of marks kept by a national Office;

(xv) "designated Office" means the national Office of the designated State;

(xvi) references to *national law* shall be construed as references to the national law of a Contracting State and, where a regional mark is involved, to the regional treaty providing for the registration of regional marks;

(xvii) "Paris Convention" means the Paris Convention for the Protection of Industrial Property;

(xviii) "Madrid Agreement" means the Madrid Agreement Concerning the International Registration of Marks;

(xix) "Union" means the International Trademark Registration Union;

(xx) "Assembly" means the Assembly of the Union;

(xxi) "Organization" means the World Intellectual Property Organization;

(xxii) "International Bureau" means the International Bureau of the Organization and, as long as it subsists, the United International Bureaux for the Protection of Intellectual Property (BIRPI);

(xxiii) "Director General" means the Director General of the Organization;

(xxiv) "Regulations" means the Regulations referred to in Article 104.

COMMENTS ON ARTICLE 2

These abbreviated expressions seem to be self-explanatory. However, the following might be noted.

*ad (iii):* The person who files an international application is called an *applicant* only as long as his application is not accepted. Once accepted, he is called the *owner of the international registration*.

*ad (ix):* As to the *Gazette*, see Rule 30 (The Gazette).

It goes without saying that, as is usual in legislative texts, the singular stands also for the plural and masculine pronouns stand also for feminine and neuter pronouns, wherever appropriate.

## CHAPTER I: SUBSTANTIVE PROVISIONS

### ARTICLE 3

*International Registrations and International Applications*

(1) The International Bureau shall register marks in the International Register of Marks according to the provisions of this Treaty and the Regulations.

(2) International registrations shall be effected on the basis of international applications.

COMMENTS ON ARTICLE 3

*Paragraph (1):* See Rule 3 (The International Register of Marks).

*Paragraph (2):* See Articles 4 (Right To File International Applications and To Own International Registrations) and 5 (The International Application).

### ARTICLE 4

*Right to File International Applications and To Own International Registrations*

(1) Any resident or national of a Contracting State may file international applications and may own international registrations.

(2)(a) Any natural person shall be regarded as a resident of a Contracting State if:

(i) according to the national law of that State, he is a resident of that State, or

(ii) he has a real and effective industrial or commercial establishment in that State.

(b) Any natural person shall be regarded as a national of a Contracting State if, according to the national law of that State, he has the nationality of that state.

(3)(a) Any legal entity shall be regarded as a resident of a Contracting State if it has a real and effective industrial or commercial establishment in that State.

(b) Any legal entity shall be regarded as a national of a Contracting State if it is constituted according to the national law of that State.

(4) If the State of the residence and the State of the nationality of the applicant or owner of the international registration are different, and only one of those States is a Contracting State, the Contracting State alone shall be considered for the purposes of this Treaty and the Regulations.

COMMENTS ON ARTICLE 4

*Paragraph (1):* See Article 5 (The International Application) and the comments thereon, as well as Rule 4 (Applicants; Owners of International Registrations).

According to Rule 5.2 (Indications Concerning the Appli cant), the international application must indicate the nation ality and the residence of the applicant. The Internationa Bureau will not examine whether these allegations are true It is not, and could not reasonably be expected to be, equipped to do so. Whether a person is the national of a State or not or the resident of a State or not, is a question which the na tional laws answer differently, and sometimes not very clear ly, particularly in the case of dual nationality. Which law should the International Bureau follow? Thus, the question whether the applicant's allegation is true can be raised only before the national Office or other authorities of each designated State. If the allegation is held to be false, the effect of the Treaty on the protection of the mark can be refused by such Office or authority on the ground that it was obtained by fraud or by virtue of some other reasoning compatible with the national law of the particular State.

*Paragraphs (2) and (3):* These provisions are based on the concepts used in the Paris Convention, which grants national treatment to "nationals of any country of the Union" (Paris Convention, Article 2(1)) and assimilates to such nationals those "who are domiciled or who have real and effective industrial or commercial establishments in the territory of one of the countries of the Union" (Paris Convention, Article 3).

*Paragraph (3):* Supranational companies are entitled to file international applications and to own international registrations if they have a real and effective industrial establishment in at least one of the Contracting States (subparagraph (a)).

*Paragraph (4):* This provision means that it is not necessary that the applicant or owner should have both the nationality of and residence in a Contracting State: compliance with one of these criteria is sufficient.

### ARTICLE 5

*The International Application*

(1)(a) The international application shall contain, as specified in this Treaty and the Regulations:

(i) an indication that it is filed under this Treaty,

(ii) indications concerning the applicant's identiy, residence, nationality, and address,

(iii) a reproduction of the mark,

(iv) a list of goods and/or services,

(v) the identification of the designated State or States.

(b) The international application may contain a declaration, as provided in the Regulations, claming the priority of one or more earlier applications filed in any country party to the Paris Convention or of one or more earlier filings that are equivalent to regular national filings within the meaning of that Conventional. Furthermore, the international application may contain such additional indications as are provided for in other provisions of this Treaty and in the Regulations.

(c) The international application shall be in a prescribed language and in the prescribed form, shall be signed as provided in the Regulations, and shall be subject to the payment of the prescribed fees.

(2) International applications shall be filed direct with the International Bureau.

[(3) Notwithstanding the provisions of the preceding paragraphs, the national law of any Contracting State may provide that if the applicant is a resident [*Alternative:* national] of that State:

(i) the mark which is the subject of the international application must have been first granted a registration in the national register of marks of that State [or must have been first filed in that State],

(ii) That State may not be designated [or may be designated only if specific conditions are fulfilled, such as that fees additional to those provided for under this Treaty must be paid],

(iii) the international application [must or] may be filed through the intermediary of the national Office of that State.]

COMMENTS ON ARTICLE 5

*Paragraph (1)(a), introductory phrase:* See Rule 5 (Mandatory Contents of the International Application).

*Paragraph (1)(a)(i):* See Rule 5.1 (Indication that the International Application Is Filed Under the Treaty).

*Paragraph (1)(a)(ii):* See Rule 5.2 (Indications Concerning the Applicant).

*Paragraph (1)(a)(iii):* See Rule 5.3 (Reproduction of the Mark; Colors, Transliteration and Translation).

*Paragraph (1)(a)(iv):* See Rule 5.4 (List of Goods and/or Services). That Rule requires, among other things, that the goods and/or services must be expressed in "precise terms" and "as far as possible in those terms appearing in the alphabetical list of the International [Nice] Classification." It is to be noted that what constitutes "precise terms" is a matter on which each designated State may pass its own judgment and, consequently, even terms appearing in the said alphabetical list may be considered not "precise."

*Paragraph (1)(a)(v):* See Rule 5.5 (Identification of the Designated State or States). The designation of one Contracting State is permitted. If paragraph (3) is retained, any Contracting State could disallow its designation by applicants who are residents [nationals] of that State, or could impose specific conditions in connection with such a designation.

*Paragraph (1)(b):* As to the claiming of priority, see Rule 6.2 (Claiming of Priority). As to the effect of such claiming, see Article 23. "Earlier filings" could be applications under the Treaty (see Article 24) or under regional treaties (OAMPI, Benelux).

The additional optional indications provided for in *other provisions of the Treaty* concern:

the choice of a certain national register (see Article 11(3) and Rule 6.5: Option Under Article 11(3)),

the declaration stating intent to use the mark in respect of any of the designated States (see Article 18(4), and Rule 6.3: Declaration of Intent To Use the Mark).

The additional optional indications provided for *in the Regulations* concern:

the preservation of rights acquired through national registrations, or through international registrations under the Madrid Agreement (see Articles 19(2) and 20(2), and Rule 6.4: Declarations Under Articles 19(2) and 20(2)),

the appointment of a representative (see Rule 6.1: Naming of a Representative),

the indication that the mark is a *"marque collective"* (see Rule 6.7: *Marque collective*),

the indication of the trade or business of the applicant (see Rule 6.6: Trade or Business of the Applicant).

*Paragraph (1)(c):* As to *language*, see Rule 7.1 (Language of the International Application).

As to *form*, see Rule 8 (Form of the International Application).

As to *fees*, see Rule 9 (Fees Payable With the Filing of the International Application), as well as Article 17 (Fees) and Rule 26 (Payment of Fees).

As to *signature*, see Rule 8.2 (Copies; Signature). The international application may be signed by the applicant's duly appointed representative (see Article 22(2), second sentence).

*Paragraph (2):* Filing may be made by deposit with the International Bureau or with any agency of that Bureau (if and when such agency is established in a place other than Geneva, Switzerland), or through mailing to the said Bureau or such agency. See Rule 24 (Transmittal of Documents to the International Bureau). However, if paragraph (3)(iii) is retained, any Contracting State could provide that the international applications of its own residents must or may (at the applicant's option) be filed through the intermediary of its own national Office.

*Paragraph (3):* This paragraph appears in brackets to indicate that opinion was divided in the October 1971 Committee of Experts on the question whether it should be retained. "The main arguments for omitting paragraph (3) were that, without it, the procedure would be uniform and more simple, and discrimination by any country against its own residents would be precluded" (Report of the Committee, document TRT/I/11, paragraph 49). Whether, if retained, this paragraph should relate to nationals or to residents is a question to be studied. That is why the word "national" appears in brackets.

*Paragraph (3)(i):* "The main argument for retaining item (1) was that a country party to both the Madrid Agreement and the proposed Treaty would be able to stipulate the same requirement under the latter as under the former, namely, previous national registration, and thus the residents of such country would not be exposed to the danger of confusion that would exist if they had to follow two different procedures" *(loc. cit.)*. Since this argument does not apply to the words "or must have been first filed in that State," those words have been placed between a second pair of brackets. If the provision is retained, the question arises whether non-compliance with it should be sanctioned in the Treaty and, if so, how. If such sanction had to be provided for, one would have to add to the requirements for international applications (paragraph (1)(a)) the stipulation that international applications filed by residents of a Contracting State making use of the faculty in question must be accompanied by an attestation by the national Office of such State that a national registration has been granted [or that a national application has been filed] in that State; issuance of the attestation would have to be preceded by a comparison—by the national Office—between the mark and the lists of the goods and/or services appearing (in some cases, in different languages) in the national registration [application] and those appearing in the international application. Furthermore, the lack of such attestation would have to be included among the reasons (Article 7(1)) for which the international registration would have to be denied by the International Bureau. Such procedures would appear to be complicated. Therefore, it would seem to be preferable—if the item is retained—not to write any sanction into the Treaty but to leave the matter of sanctions to the national law and the national procedures of the State of which the applicant is a resident. Rule 14.5 implements this thought.

*Paragraph (3)(ii):* The main argument used by those in the October 1971 Committee of Experts who wished to retain this item was that "some States might wish to prohibit the so-called self-designation" *(loc. cit.)*. Since this argument applies only to the first six words of the item, the rest of the provision has been placed between a second pair of brackets. Even if the provision is maintained, possible non-compliance with it does not seem to require any sanction in the Treaty since the simplest and most effective sanction would consist in refusing the effect provided for in Article 11(2) by the national Office of the self-designated State. Rule 14.5 implements this thought.

*Paragraph (3)(iii):* The main argument used by those in the October 1971 Committee of Experts who wished to retain this item was that "filing international applications through the intermediary of the applicant's national Office might be convenient to the applicant, particularly in countries at a great distance from Geneva" *(loc. cit.)*. Since this argument applies only to the clause in the permissive form, the words "must or" have been placed between a second pair of brackets. If the item is retained, and is retained only in the permissive form, it will contain no obligation and therefore any sanction is excluded by definition. If the item is retained, and is retained in its mandatory ("must") form, one could proceed in either of the two ways indicated above in connection with item (i).

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## ARTICLE 6

### *Later Designation*

(1) Any Contracting State not designated in the international application or whose designation has been cancelled may be designated by the applicant or, once the international registration has been effected, by the owner of the international registration, as provided in the Regulations ("later designation").

(2)(a) Any later designation shall be the subject of a request filed direct with the International Bureau and containing, as specified in the Regulations:

(i) an indication that it is for later designation under this Treaty,

(ii) indications concerning the identity, residence, nationality and address of the applicant or, where the international registration has already been effected, of the owner of the international registration,

(iii) the identification of the international application or, once the international registration has been effected, of such registration,

(iv) the identification of the later designated State.

(b) The request may contain a declaration, as provided in the Regulations, claiming the priority of one or more applications filed in any country party to the Paris Convention or of one or more filings that are equivalent to regular national filings within the meaning of that Convention. Furthermore, the request may contain such additional indications as are provided for in other provisions of this Treaty and in the Regulations.

(c) The request shall be in a prescribed language and in the prescribed form, shall be signed as provided in the Regulations, and shall be subject to the payment of the prescribed fees.

(d) Where, at the time of filing the request, different persons are the owners of the international registration for the purposes of different designated States, the request may be made by any of such owners, provided it does not relate to a Contracting State already designated by one of the other such owners.

[(3) Notwithstanding the provisions of paragraph (1), the national law of any Contracting State may provide that, if the applicant or, once the international registration has been effected, the owner of the international registration is a resident [*Alternative:* national] of that State,

that State may not be designated [or may be designated only if specific conditions are fulfilled such as that fees additional to those prescribed under this Treaty must be paid].]

COMMENTS ON ARTICLE 6

*Paragraph (1):* Any later designation may relate not only to a State which was never designated but also to one whose designation was cancelled (because of the withdrawal of the designation or on the basis of Articles 12 or 13). For the latter case, such designation would generally make sense only if the reason for cancellation no longer existed.

*Paragraph (2)(a), introductory phrase:* See Rule 10 (Mandatory Contents of the Request for Recording of Later Designation).

As to the word *direct*, see Rule 24 (Transmittal of Documents to the International Bureau); the transmittal of the request may consist in handing over or mailing to the International Bureau or any agency thereof.

In connection with the word *request*, the following terminological pattern of the Draft may be noted: a petition for international registration is called an *application*, a petition for the recording of a later designation is called a *request*, a petition for renewal is called a *demand*; furthermore, only applications lead to *registration*, all other petitions lead to *recording*.

*Paragraph (2)(a)(i):* See Rule 10.1 (Indication That the Request Is For Recording of Later Designation).

*Paragraph (2)(a)(ii):* See Rule 10.2 (Indications Concerning the Applicant or the Owner of the International Registration). The indication of the residence and nationality of the applicant or owner is necessary since between the time of the filing of the international application and the time of the filing of the request for recording the later designation his residence or nationality may undergo changes which no longer allow him to own international registrations. His address may also have changed.

*Paragraph (2)(a)(iii):* See Rule 10.3 (Identification of the International Application or International Registration).

*Paragraph (2)(a)(iv):* See Rule 10.4 (Identification of the Later Designated State.

*Paragraph (2)(b):* As to the claiming of priority, see Rule 11.1 (Claiming of Priority).

The additional optional indications provided for in *other provisions of the Treaty concern:*

the choice of a certain national register (see Article 11(3), and Rule 11.5: Option Under Article 11(3)).
the declaration of intent to use the mark in respect of the designated State (see Article 18(4), and Rule 11.2: Declaration of Intent To Use the Mark).

The additional optional indications provided for *in the Regulations* concern:

the possibility of presenting a more limited list of goods and/or services in respect of the later designated State than the list appearing in the international registration (see Rule 11.4: List of Goods and/or Services).
the preservation of rights acquired through national registrations, or through international registrations under the Madrid Agreement (see Articles 19(2) and 20(2), and Rule 11.3: Declarations Under Articles 19(2) and 20(2)).

*Paragraph (2)(c):* As to *language*, see Rule 7.2 (Language of the Request for Recording of Later Designations).

As to *form*, see Rule 12 (Form of the Request for Recording of Later Designation).

As to *fees*, see Rule 13 (Fees Payable With the Request for Recording of Later Designation), as well as Article 17 (Fees) and Rule 26 (Payment of Fees).

As to *signature*, see Rule 12.2 (Copies; Signature). The request may be signed by the duly appointed representative (see Article 22(2), second sentence).

*Paragraph (2)(d):* Any designation contrary to this provision will be declined by the International Bureau (see Article 8(1)(x)). This, however, would not prevent the unsuccessful owner from filing a new international application for the same mark and the same goods and/or services and designating the State which, through the attempted later designation, he was not entitled to designate. By forcing him into the latter solution, the International Register is kept clearer since the designation of the same State on *the basis of the same international registration* by different owners could more easily lead to confusion.

*Paragraph (3):* See the comments on Article 5(3) and item (ii) of Article 5(3). The reference to Rule 14.5 should be understood as a reference to Rule 15.5.

## ARTICLE 7

### *International Registration or Declining of the International Application*

(1) The International Bureau shall promptly effect the international registration as applied for except:

(i) where the international application does not contain an indication that it is filed under this Treaty,
(ii) where the international application is in a language other than one of the prescribed languages,
(iii) where the international application contains no indications concerning the residence or nationality of the applicant or only such indications as do not permit the conclusion that he has the right to file international applications,
(iv) where the international application contains no indications concerning the applicant's identity and address or only such indications as do not permit him to be identified and reached by mail,
(v) where the international application does not include the reproduction of the mark,
(vi) where the international application does not list any goods and/or services,
(vii) where the international application does not designate any Contracting State,
(viii) where the international application is not signed,
(ix) where the prescribed fees are not paid.

(2) Where the only defect is or the only defects are that the international application has not been signed and/or that the fees paid are less than the amount prescribed but at least attain the amount ("minimum amount") fixed in the Regulations, the International Bureau shall invite the applicant to sign the application or to pay the missing part of the fees, as the case may be; if the invitation is complied with within the prescribed time limit, the International Bureau shall effect the international registration.

(3)(a) The International Bureau shall, subject to paragraph (4)(b), decline the international application, notify the applicant accordingly, and reimburse to him such amounts as are specified in the Regulations, where the defect or defects consist of:

(i) any of those referred to in paragraph (1), items (i) to (vii), or
(ii) the fact that no fees have been paid or the amount paid was less than the minimum amount referred to in paragraph (2), or
(iii) the fact that the invitation referred to in paragraph (2) has not been complied with within the time limit referred to in that paragraph.

(b) The International Bureau shall not proceed under subparagraph (a) before the expiration of six months from the date on which it received the international application.

(4)(a) Subject to subparagraph (b), the date under which the international registration shall be effected ("international registration date") is the date on which the international application was received by the International Bureau.

(b) Where any defect referred to in paragraph (3)(a)(i) or (ii) is corrected within the six months period referred to in paragraph (3)(b), or where the missing signature is furnished or the difference between the minimum amount of fees and the required amount of fees is paid after the expiration of the time limit referred to in paragraph (2) but within the said six months period, the International Bureau shall effect the international registration and the international registration date shall be the date on which the International Bureau receives the required correction or payment, provided that by that date all defects have been corrected and all required fees have been paid.

COMMENTS ON ARTICLE 7

*Paragraph (1):* As to the registration, see Rule 3.1 (Keeping of the Register).

The possible defects listed under (i) to (vii) are all so basic that the paper purporting to be an international application cannot reasonably be considered or treated as one. The comments on Article 5(1) refer in more detail to the applicable Rules, which are the following: for item (i), Rule 3.1; for item (ii), Rule 7.1; for items (iii) and (iv), Rule 5.2; for item (v), Rule 5.3; for item (vi), Rule 5.4; for item (vii), Rule 5.5. It is to be noted that items (iii) and (iv) concerning the identification of the applicant do not necessarily require compliance with all the provisions of Rule 5.2.

Whereas, in the case of the said defects, the international application will be declined automatically, the possible defects mentioned in items (viii) and (ix)—lack of signature or no payment or insufficient payment of the fees—are treated differently: the first always, the second in some cases. In the

case of *lack of signature*, the applicant will be given a chance to furnish the signature (see paragraph (2)) and, if he does so within one month (see Rule 14.1), his application will be registered under the date on which it was received by the International Bureau (see paragraph (4)(a)). As far as *fees* are concerned, two separate cases are envisaged with different consequences. Where the applicant has paid less than the amount prescribed but at least as much as the minimum amount defined in the Regulations (see Rule 14.2), he will be given a chance to pay the difference and, if he does so within one month (see Rule 14.1), his application will be registered under the date on which it was received by the International Bureau (see paragraph (4)(a)). On the other hand, where the applicant has paid no fees whatsoever, or paid less than the minimum amount, or—despite having paid at least the minimum amount—has not paid the difference within the said one-month time limit, his application will be declined (see paragraph (3)). However, even in such cases, as well as those where the time limit for furnishing the missing signature has lapsed without its having been furnished, and even in the case of any of the other defects, the applicant may pay the (missing) fees and correct the defects any time before the expiration of six months from the date on which it received the defective international application; if he does so, that application will not be declined, but the international registration will not be effected under the date on which the international application was received but under the date on which payment of the fees was made (completed) and all the defects were corrected (see paragraphs (3)(b) and (4)(b)).

It is to be noted that, when the defect is other than lack of signature or fees above the minimum but less than required, the International Bureau may call the attention of the applicant to it (see Rule 14.3: Calling Attention to Defects Other Than Those Referred To in Article 7(2)); when it is either of the said two, the International Bureau must invite the applicant to correct it (Article 7(2)).

Possible defects not sanctioned by declining the international application are, for example, non-compliance with the requirement of transliteration and translation (Rule 5.3: Reproduction of the Mark: Colors, Transliteration and Translation), and non-compliance with the requirement that goods and/or services must be grouped according to the International (Nice) Classification (Rule 5.4: List of Goods and/or Services). In such cases, the International Bureau proceeds itself with the transliteration, translation or grouping (see the cited Rules) and may charge the applicant a fee (Rule 9.2: Fees Payable in the Case of Certain Defects in the International Application). It will probably charge no fee where the work is not substantial. Non-payment would have no legal consequence.

*Paragraph (2):* The time limit is one month from the date of the registered letter which the International Bureau must send to the applicant, inviting him to sign his application or, where the fees paid are more than the minimum amount but less than the required amount, to pay the missing part of the fees (see Rule 14.1: Time Limit Under Article 7(2)). The "minimum amount" is fixed in Rule 14.2 (Minimum Amount Under Article 7(2)).

*Paragraph (3)(a):* See Rule 14.4 (Notification, and Reimbursement of Certain Fees, Under Article 7(3)).

Where the International Bureau declines the international application or, more precisely, declines to give the status of an international application to a paper purporting to be an international application, the applicant has no instance to appeal to since any such instance could only be an international tribunal and the matter in question could hardly justify the institution of such heavy machinery. Of course, if the International Bureau erred in finding a defect when in fact there was none, it can be alerted to it and come back on its decision. But even if it perseveres in its error, all the consequences of that error can be avoided by making use of the possibility offered to him by Article 9 (Avoiding the Effects of Declining).

*Paragraph (3)(b):* This subparagraph means that any defect may be corrected within six months of the (attempted) filing of the defective international application without the need to refile that application. However, the international registration date will not be the date on which the defective application was filed but the date on which the defect was corrected (see paragraph (4)(b)), except where, in the cases envisaged in paragraph (2), the condition stated therein is fulfilled.

*Paragraph (4)(a):* Naturally, where the international application has been declined, there will be no "international registration date."

*Paragraph (4)(b):* See the comments on paragraph (3)(b).

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## ARTICLE 8

### *Recording or Declining of Later Designation*

(1) Any later designation shall be recorded by the International Bureau according to the request for the recording thereof except:

(i) where the request does not contain an indication that it is for a later designation under this Treaty,

(ii) where the request is in a language other than one of the prescribed languages,

(iii) where the request contains no indications concerning the residence or nationality of the applicant or, where the international registration has already been effected, of the owner of such registration, or only such indications as do not permit the conclusion that he has the right to file international applications and to own international registrations,

(iv) where the request contains no indications concerning the identity and address of the applicant, or, where the international registration has already been effected, of the owner of such registration, or only such indications as do not permit him to be identified and reached by mail,

(v) where the request does not identify the international application or, once the international registration has been effected, such registration,

(vi) where the request does not designate any Contracting State,

(vii) where the request contains a list of goods and/or services which is different from the list contained in the international application or international registration and does not conform with the concept of limitation as defined in the Regulations,

(viii) where the request is not signed,

(ix) where the prescribed fees are not paid,

(x) where, at the time of filing the request, different persons are the owners of the international registration for the purposes of different designated States and the request designates a Contracting State which has already been designated by one of such owners other than the owner making the request.

(2) Where the only defect is or the only defects are that any request for recording a limitation of the list of goods and/or services does not conform with the concept of limitation as defined in the Regulations, that the request for recording the later designation has not been signed, or that the fees paid are less than the amount prescribed but at least attain the amount ("minimum amount") fixed in the Regulations, the International Bureau shall invite the applicant or, once the international registration has been effected, the owner of such registration to conform the list of goods and/or services to the said concept of limitation, to sign the request, or to pay the missing part of the fees, as the case may be; if the invitation is complied with within the prescribed time limit, the International Bureau shall proceed with the recording of the later designation.

(3)(a) The International Bureau shall, subject to paragraph (4)(b), decline the request, notify accordingly the applicant or, once the international registration has been effected, the owner of such registration, and reimburse to him such amounts as are specified in the Regulations, where the defect or defects consist of:

(i) any of those referred to in paragraph (1), items (i) to (vi), or

(ii) the fact that no fees have been paid or the amount paid was less than the minimum amount referred to in paragraph (2), or

(iii) the fact that the invitation referred to in paragraph (2) has not been complied with within the time limit referred to in that paragraph, or

(iv) that referred to in paragraph (1)(x).

(b) The International Bureau shall not proceed under subparagraph (a) before the expiration of six months from the date on which it received the request for recording the later designation.

(4)(a) Subject to subparagraph (b), the date under which the later designation shall be recorded ("recording date of the later designation") is the date on which the request for recording the later designation was received by the International Bureau.

(b) Where any defect referred to in paragraph (3)(a)(i) or (ii) is corrected within the six months period

referred to in paragraph (3)(b), or where the conforming with the concept of limitation, the furnishing of the signature or the payment of the difference between the minimum amount of fees and the required amount of fees is effected after the expiration of the time limit referred to in paragraph (2) but within the said six months period, the International Bureau shall record the request and the recording date of the later designation shall be the date on which the International Bureau receives the required correction or payment, provided that by that date all defects have been corrected and all required fees have been paid.

COMMENTS ON ARTICLE 8

*Paragraph (1):* As to the recording, see Rule 3.1 (Keeping of the Register).

The possible defects listed under (i) to (vi) are all so basic that the paper purporting to be a request for the recording of a later designation cannot reasonably be considered or treated as one. The comments on Article 6(2) refer in more detail to the applicable Rules, which are the following: for item (i), Rule 10.1; for item (ii), Rule 7.2; for items (iii) and (iv), Rule 10.2; for item (v), Rule 10.3; for item (vi), Rule 10.4. It is to be noted that items (iii) and (iv) do not necessarily require compliance with all the provisions of Rule 10.2.

As to item (vii), it is to be noted that the request for the recording of later designation may relate to less than all the goods and/or services appearing in the international registration, since the owner of the international registration may have reasons for aiming at a more limited list in the newly designated State than in those States which were designated in the international application. However, he will have to comply with the requirement that the new list conform with the concept of limitation as defined in Rule 22.2 (Concept of Limitation).

As to the possible defects concerning the limitation of the list of goods and/or services as well as to those referred to in items (viii) and (ix), the solution parallels that provided for in connection with international applications suffering from defects analogous to the two last mentioned. The third and fourth paragraphs of the comments on Article 7(1) apply here too. See also Rule 15.3 (Calling Attention to Defects Other Than Those Referred to in Article 8(2)).

The defect referred to in item (x) cannot be corrected, not even under paragraph (4)(b).

*Paragraph (2):* The time limit is one month from the date of the registered letter which the International Bureau must send to the applicant or the owner of the international registration, inviting him to conform with the concept of limitation, to sign the request or to pay the missing part of the fees (see Rule 15.1: Time Limit Under Article 8(2)). The "minimum amount" is fixed in Rule 15.2 (Minimum Amount Under Article 8(2)).

*Paragraph (3)(a):* See Rule 15.4 (Notification, and Reimbursement of Certain Fees, Under Article 8(3)). In the case of any erroneous declining of the request for the recording of later designation, the same guarantees are provided for as in the case of erroneous declining of the international application (see Article 9 (Avoiding the Effects of Declining) and the comments on Article 7(3)(a)).

*Paragraph (3)(b):* This provision parallels Article 7(3)(b), and the comments made on that provision apply here too, *mutatis mutandis*.

*Paragraph (4)(a):* Naturally, where the request has been declined, there will be no recording date.

*Paragraph (4)(b):* This provision parallels Article 7(4)(b), and the comments made on that provision apply here too, *mutatis mutandis*.

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## ARTICLE 9

### *Avoiding the Effects of Declining*

(1) Where the International Bureau has declined the international application or a request for the recording of later designation, the applicant or the owner of the international registration may, within the prescribed time limit, file with the national Office of any State designated in the said declined application or request a petition for the purpose of requesting the International Bureau to proceed, in respect of that State, with the international registration of the mark and the recording of the designation of the said State or, where the international registration has already been effected, with the recording of the designation of that State. He shall, within the same time limit, transmit a copy of the petition to the International Bureau. If the petition relates to a mark which is already registered in the International Register of Marks, the International Bureau shall, as provided in the Regulations, record and publish the fact that it has received a copy of such petition.

(2) If the national Office or other competent authority of the said State finds that the declining, by the International Bureau, of the international application or of the request for the recording of later designation was unjustified under this Treaty and the Regulations, the national Office of the said State shall request the International Bureau to proceed as provided in paragraph (1). [It may request the International Bureau so to proceed even in the absence of any such finding.]

(3) The International Bureau shall proceed as requested.

COMMENTS ON ARTICLE 9

*Paragraph (1):* As to the purpose of this Article, see the comments on Articles 7(3) and 8(3).

The time limit in question is three months from the date of the registered letter of the International Bureau notifying the fact that the international application or the request for later designation has been declined (see Rule 16.1). See also Rules 16.2 (Recording and Publication Under Article 9(1)) and 16.3 (Notification of National Offices Under Article 9(1)).

A matter to be studied further is whether the Treaty should not allow the applicant to choose between two possibilities: one contained in this Article and another which was provided in the Article bearing the same number in document TRT/I/3 of April 13, 1971. That Article read as follows:

> "(1) Where the International Bureau has declined the international application or a request for recordal of later designation, the applicant or the owner of the international registration may, within the prescribed time limit, file with the national Office of any State which the said applicant or owner has attempted to designate an application ("national application") for the registration, in the national register of marks, of the same mark in respect of a list of goods and/or services not extending beyond the list of goods and/or services indicated in the international application or the request for recordal of later designation.
>
> "(2) The national application thus filed with the said national Office shall be treated as if it had been filed on the date on which the declined international application or the declined request for recordal of later designation was filed with the International Bureau, provided that the national Office finds that the declining, by the International Bureau, of the international application or of the request for recordal of later designation was unjustified under this Treaty and the Regulations and provided further that the national application complies with all the requirements of the national law of the interested State laid down for national applications."

The above text was accompanied by the following comments in the said document:

> *"Paragraph (1):* As to the purpose of this Article, see the comments on Articles 7(3) and 8(3).
>
> "The time limit in question is three months from the date of the registered letter of the International Bureau notifying the fact that the international application or the request for later designation has been declined (see Rule 16.1).
>
> *"Paragraph (2):* This provision means that, if the attempted—but declined—international application or request for the recordal of a later designation was filed within the six-month priority period provided for in the Paris Convention, the national application in question would also benefit from that priority.
>
> "In order to be able to furnish evidence to the national Office in question that he did file an international application and that it was declined in error, the applicant may ask the International Bureau to communicate to the national Office a copy of the entire file of his case (see Rule 16.2: Notification to National Offices Under Article 9(2)).
>
> "The question arises whether a similar possibility should be offered to the owner of the international registration where the International Bureau has erred in applying a later effective date under the second sentence of Article 7(4) or the second sentence of Article 8(4)."

*Paragraph (2):* This provision means, in effect, that any designated State may force the International Bureau into recording its designation and, if the international registration has not been effected, also into effecting such registration. But if such registration is effected, it will have effect only in respect of the designated State which has forced the registration. However, the International Bureau may, at its own discretion, reverse its decision to decline also in respect of other designated States.

Whether the last sentence should be maintained is a matter to be studied further. The main argument for omitting it would be that if the national Office finds that the declining was justified there is no good reason for requesting the International Bureau to proceed. The main argument for retaining it is that the mistake on which the declining was based—of necessity, since the International Bureau has no discretion—may be insignificant (for example, the fact that the fees were only a few francs short of the required amount) and it would only be equitable to disregard such a mistake.

*Paragraph (3):* "As requested means as requested by the national Office of the designated State.

A matter to be studied further is whether the scope of this Article should be extended so as to cover not only the cases

where the International Bureau declines the international application or the request for recording later designation but also the cases where the International Bureau refuses to honor a request for recording a change in ownership (see Article 14), a request for recording a change in the list of goods and/or services (now covered in Article 15(3)(b)), and a demand for renewal (see Article 16). Another solution could consist in making Article 9 applicable to any decision of the International Bureau in connection with which the applicant or the owner of the international registration alleges that the International Bureau has erred.

## ARTICLE 10

### *Publication and Notification*

(1) International registrations and recordings of later designations shall be promptly published by the International Bureau, as provided in the Regulations.

(2) International registrations and recordings of later designations shall be promptly notified by the International Bureau to the national Offices of each designated State, as provided in the Regulations.

#### COMMENTS ON ARTICLE 10

*Paragraph (1):* The publication shall take place in the Gazette of the International Bureau, since Article 2(ix) provides that "references to any publication by the International Bureau shall be construed as references to publications effected in the official Gazette of that Bureau."

As to the contents of the publication, see Rule 17.1 (Contents of Publication of International Registrations): The publication will be effected in English and French (see Rule 30.3: Languages of the Gazette), normally within between ten and twenty days from the international registration date if it is assumed that preparations for the registration and publication will last approximately ten days and if it is considered that the Gazette will be weekly (see Rule 30.2: Frequency of Issue of the Gazette).

The Regulations contain no provision on the question whether the registration of a mark relating to goods and/or services belonging to several classes of the Nice Classification should be published as one item or as many items as there are classes. The matter will be regulated in the Administrative Instructions. The present intention is to proceed as follows. The Gazette will have a separate section for each class of the Nice Classification. Each registration which relates to one class only will be published in the section corresponding to that class. Where any registration relates to several classes it will be published in the section corresponding to that class which has the lowest number among the said classes, whereas in each other relevant section merely the international registration number or international later designation number and the page number of the Gazette on which the registration appears will be mentioned.

As to access to information through other means than the Gazette, see Rule 31 (Copies and Other Information Available to the Public).

*Paragraph (2):* See Rule 18 (Notification of International Registrations and Recordings of Later Designations), according to which the notification will essentially consist of a reprint of the relevant passages in the Gazette. However, where the international application or the request for the recording of the later designation contains a declaration of intent to use the mark, the notification to the interested designated Office will also include a copy in full of that application or request (see Rule 18.1(iii)).

## ARTICLE 11

### *Effects of International Registration and of Recording of Later Designation*

(1) [*National Application Effect*] The international registration of a mark and the recording of any later designation, published and notified as provided in Article 10, shall have the same effect in each designated State as if an application for the registration of the mark in the national register of marks had been filed with the national Office of that State on the international registration date or on the recording date of the later designation, as the case may be.

*ALTERNATIVE A:*

(2) [*National Registration Effect*] Furthermore, the said international registration and recording shall, subject to Articles 12 and 13, have the same effect in each designated State as if the mark had been registered in the national register of marks of that State; such effect shall come into existence in any designated State:

(i) where no refusal or notice that a refusal may eventually be pronounced ("notice of possible refusal") has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a), at the expiration of that time limit,

(ii) where a refusal or a notice of possible refusal has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a), if and when, and to the extent to which, the refusal is reversed by a final decision or the final decision taken in the proceedings referred to in the notice of possible refusal results in acceptance of the effect provided for in this paragraph,

and shall be deemed to have started as of the international registration date or the recording date of the later designation, as the case may be.

*ALTERNATIVE B:*

(2) [*National Registration Effect*] Furthermore, the said international registration and recording shall, subject to Articles 12 and 13, have the same effect in each designated State as if the mark had been registered in the national register of marks of that State on the following date:

(i) where no refusal or notice that a refusal may eventually be pronounced ("notice of possible refusal") has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a), on the day following the expiration of that time limit, or

(ii) where a refusal has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a) but the refusal is subsequently reversed, on the date on which the decision of reversal becomes final, or

(iii) where a notice of possible refusal has been notified by the national Office of that State within the time limit fixed in Article 12(2)(a) but a decision taken in subsequent proceedings results in acceptance of the effect provided for in this paragraph, on the date on which that decision becomes final.

*BOTH ALTERNATIVES:*

(3) [*Several National Registers*] Where, in any designated State, there is more than one national register of marks, the reference in paragraphs (1) and (2) to the national register of marks shall be construed as a reference to that national register which affords the highest degree of protection, unless another register is indicated in the international application or the request for the recording of the later designation, or in a communication filed direct with the designated Office. In the case of such indication, the reference in paragraphs (1) and (2) to the national register of marks shall be construed as a reference to the register so indicated.

#### COMMENTS ON ARTICLE 11

*Paragraphs (1) and (2):* These two paragraphs state the two effects of the international registration: the first is the same as that of national filing, the second is the same as that of national registration. In these comments, the first will sometimes be referred to as the "*national application effect* (of the international application)," and the second as the "*national registration effect* (of the international registration)."

These indications appear also at the beginning of the paragraphs, in brackets, as a sort of title. Neither these nor any other such paragraph titles are intended to remain in the text of the Treaty beyond the draft stages.

*Paragraph (1):* The national application effect comes into existence as of the international registration date, which is generally the date on which the international application was received by the International Bureau (see Article 7(4)(a)) or, in the case of a later designation, as of the recording date of the later designation, which generally is the date on which the request for recording the later designation is received by the International Bureau (see Article 8(4)).

In essence, this paragraph provides that an international registration has the same effect as a national application. It should be noted that it contains no provision attempting to harmonize the effects attached to national application under the various national laws. Consequently, each State's national law will continue to be completely free in this respect. Whatever effect is provided for national applications will be applicable under this paragraph to international registrations.

*Paragraph (2):* This provision, together with the provision on renewals, is the most important one of the Treaty. The Treaty is being concluded for the very reason that a single (international) registration should be able to take the place of the separate (national) registrations in each of those States in which the owner of the mark is interested in obtaining protection. This is the provision which accomplishes the desired aim.

The provision means that the effect of the international registration in each designated State (whether designated in the international application or later) is the same as that of the registration of the same mark, for the same goods and/or services, in the national register of marks of that State "(national registration effect)."

It should be noted that neither this provision nor any other provision of the Treaty attempts to harmonize the effects attached to national registration under the various national laws. Consequently, each State's national law will be free to provide the effects it desires to provide for national registration and whatever effect is so provided will be applicable under this paragraph to international registrations. One of the examples of the freedom of national laws is that no given time limit has necessarily to be computed from the date of registration; thus, for example, any requirement of the national law concerning incontestability or the use of the mark may run from any point in time (subject, of course, as far as use is concerned, to respecting Article 18(3)), but any time limit or right which, according to the national law, runs from the national registration date (as distinguished from national filing), will run from the international registration date unless the Treaty provides for exceptions or a different system. (For the sake of simplicity, the comments on this paragraph speak only of the international registration date; however, the expression should always be understood as including also the recording date of the later designation when the designation has not been made in the international application but in a later request.)

Furthermore, it should be noted that protection cannot be acquired, through international registration, in a designated State for marks which are unregistrable in the national register of that State, for example, service marks in States in which service marks are not registrable. If such a State is designated, its authorities should use the right of refusal given to it by Article 12; but, even if they fail to refuse, the designation will have the same effect (i.e., in most cases, none) as that of a national registration made in error.

Finally, it should be noted that the fact that the effect, once acquired, is the same as that of a national registration implies that it can be taken away for the same reasons as those for which a national registration can be cancelled, for example, because it should never have been made (because accepting it for registration was contrary to the law), or because it has not been renewed, or because the mark is not being used when it should be. However, in some of these cases, the Treaty provides for guarantees or alternative possibilities: cancellation must strictly follow the national treatment principle of the Paris Convention (see Article 12), renewal is to be effected internationally (see Article 16), and use generally cannot be required during an initial period of usually three (or five) years after the international registration or the later designation (see Article 18(3)(a)).

All that precedes applies to both Alternatives A and B. What follows deals with the difference between these two Alternatives.

The difference between the two Alternatives concerns the question when the national registration effect starts. According to Alternative A, it would start *on the international registration date.* According to Alternative B, it would start, where there is no "complication," i.e., refusal or notice of possible refusal, *at the end of the 12 (or 15) months period* during which refusal or notice of possible refusal may be forthcoming (see Article 12(2)(a)) *or,* where there is a "complication," if and *when it is resolved in favor of the applicant.*

Alternative A has the advantage that it fixes a uniform starting date, which appears to have the merit of simplicity. Alternative B has the advantage that it avoids the principle of retroactivity, which might raise fears that rights of third parties may be prejudiced, and that it avoids the possible need to change certain national laws in certain respects (see below).

It is believed, however, that the differences are more apparent than real and the advantages more theoretical than practical.

This is so because according to the national laws of most countries most effects of national registration are retroactive to the date of national filing. Thus, even under Alternative B, there would practically be a *de facto* retroactivity and to the same uniform date (the date on which the international registration was filed) as under Alternative A. For example, in many countries a registered mark prevails against conflicting marks if it has been filed before those other marks are filed; in others, it prevails if it has been used before those other marks are used. In neither case is the date of registration of any relevance.

Admittedly, there are certain effects under some national laws which start from registration only. For example, in some countries infringement actions may be brought only after registration. It is to cover those situations without having to change those laws (either in the sense that the said effects would also start from filing or from some event other than registration) that Alternative B is proposed. Another solution would consist in adopting Alternative A but with a proviso or some other provision (perhaps a reservation) which would allow any Contracting State which "repeats" the international registration in its national register to apply the said effects from the date it "repeats" the international registration, provided that the national Office notifies the International Bureau of the date of such "repeating" within the 12 months period. (Where item (ii) of Alternative A applies, the 12 months period would, naturally, not apply.)

*Paragraph (3):* This paragraph is intended, in particular, to cover the situation existing in the United States of America, the United Kingdom, and a number of States following the UK system, namely, that there are two registers of marks ("Principal" and "Supplemental" in the United States of America or "Part A" and "Part B" in the United Kingdom). The provision leaves it to the discretion of the applicant or the owner of the international registration to decide whether the national registration effect will, in the said examples, relate to the Principal Register or to the Supplemental Register, or to the Part A Register or to the Part B Register. If the application, or the request for recording of a later designation or a communication addressed to the interested designated Office does not contain an indication that the Supplemental Register or the Part B Register is chosen, the effect will relate to the Principal Register or the Part A Register, since they afford a higher degree of protection than the Supplemental Register and the Part B Register. See Rule 6.5 (Option Under Article 11(3)) and Rule 11.5 (Option Under Article 11(3)).

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## ARTICLE 12

*Refusal of the Effect Provided for in Article 11(2)*

(1) Subject to the provisions of paragraph (2) and Articles 18, 19(3) and 20(3), the effect provided for in Article 11(2) may, in respect of any designated State, be refused by the competent authorities of that State for the same reasons and to the same extent as those in respect of which applications for the registration of marks in the national register of marks may be refused under the national law of the said State, provided that such reasons are not incompatible with this Treaty and the Regulations or the Paris Convention, and provided that Article 6*quinquies* of the Paris Convention shall apply also to marks registered under this Treaty, the international registration taking the place, for the purposes of the said Article 6*quinquies*, of registration in the country of origin.

(2)(a) Any refusal under paragraph (1) shall be effective only:

(i) if the refusal or the notice of possible refusal is notified, as provided in the Regulations, by the national Office of the designated State to the International Bureau so that the latter receives it within 12 [*Alternative:* 15] months from the date of the publication of the international registration, or, in the case of a later designation, of the recording of the later designation of such State, and

(ii) in the case of a refusal, if the reasons for the refusal are specified,

(iii) in the case of a notice of possible refusal followed by a refusal, if the notice specifies, as provided in the Regulations, the reasons for which a refusal may eventually be pronounced, and provided that the reasons given in the final decision of refusal include at least one of the reasons specified in the said notice and the said decision is or is also based on that reason. [Where the said decision is that of a court, it shall be effective even if it is not based on any of the reasons specified in the notice of possible refusal.]

[(b) Where the notice of possible refusal received by the International Bureau within the time limit fixed in subparagraph (a)(i) includes reasons adduced by a third party in an opposition procedure and that party later adduces supplemental reasons, the said reasons shall be considered to have been included in the notice of possible refusal if they are notified, as provided in the Regulations, by the designated Office to the International Bureau so that the latter receives them within three [*Alternative:* six] months from the expiration of the said time limit.]

(3)(a) The International Bureau shall, as provided in the Regulations, notify the owner of the international registration of any notification received under paragraph (2) and publish a notice concerning such notification.

(b) The owner of the international registration shall, in any designated State, have the same remedies against any decision of refusal and shall have the same procedural and substantive rights in connection with any intended possible refusal, whether ex officio or based on the opposition of a third party, as have applicants who apply for the registration of marks in the national register of marks of the State in question.

(4)(a) Where the decision of refusal is final, the national Office of the designated State shall notify the International Bureau accordingly, and that Bureau shall notify the owner of the international registration, record the final decision, cancel the designation of that State, or, in a case where the final decision relates to some only of the goods and/or services listed, cancel in respect of the said State those goods and/or services to which the said decision relates, and publish such cancellation.

(b) Where a non-final refusal or a notice of possible refusal has been notified under paragraph (2) and the final decision results in acceptance of the effect referred to in Article 11(2), the national Office of the designated State shall notify the International Bureau accordingly.

(c) The details of the procedures referred to in subparagraphs (a) and (b) are provided in the Regulations.

COMMENTS ON ARTICLE 12

*Paragraph (1):* This paragraph enunciates the principle according to which the "national registration effect" may not, on the basis of an international registration, materialize for the same reasons as those for which the national registration of a mark applied for direct in the national Office cannot be granted.

The principle is qualified in three respects, *First*, the refusal must follow certain procedural requirements (see paragraph (2)). *Secondly*, the refusal cannot be in violation of Article 18, which provides for the non-applicability of certain national requirements generally or for a limited period of time. *Thirdly*, the national registration effect cannot be put, so to speak, in double jeopardy by exposing the mark to a new possibility of refusal when it has already been exposed to such possibility because the mark which is the subject of the international registration is no more and no less than a mark which is already in the national register or which is already in the other international register, namely, that maintained under the Madrid Agreement (see Article 19 (Preservation of Rights Acquired Through National Registration) and Article 20 (Preservation of Rights Acquired Through International Filing Under the Madrid Agreement)). The question that may arise is why a State in which the mark is already protected (by virtue of a national registration or by virtue of the Madrid Agreement) should be designated at all under the Treaty. The answer is that under the Treaty the surveillance of renewals is much simpler if not also much cheaper (see Article 16(2) and the comments accompanying Article 19(1)).

The grounds on which the refusal is based must not be incompatible with the provisions of the Treaty and the Regulations or of the Paris Convention. That they must not be incompatible with the Treaty and the Regulations is a matter of course. That they cannot be incompatible with the Paris Convention follows from the fact that only States members of the Paris Union may become party to the Treaty (see Article 108(1)). These matters are dealt with in the first proviso of the paragraph under consideration.

The second proviso provides that the refusal must also respect Article 6*quinquies* of the Paris Convention. In this case, the mere reference to the Paris Convention would not suffice since the said Article refers to the notion of country of origin, and marks which are the subject of international registration do not have a country of origin when the international registration is not preceded by a registration in the national register of a country. Sections B and C of Article 6*quinquies* provide the reasons for which marks may be "denied registration" or may be "invalidated" (Section B) or may be "refused" (Section C). In the Draft Treaty's terminology, these acts are called refusals or cancellations (Articles 12 and 13). It is to be noted that, since Article 6*quinquies* of the Paris Convention deals only with grounds of refusal concerning the mark as such (the mark itself), any national law providing for refusal or cancellation for lack of bona fide intent to use the mark, lack of actual use, or multiplicity of applicants, would be compatible with Article 6*quinquies* and hence, subject to the provisions of Article 18, also with the paragraph in question.

*Paragraph (2), generally:* This paragraph specifies the procedural requirements which any refusal, to be effective under the Treaty, must satsify. Roughly stated, it means that the refusal can generally be based only on such grounds as are notified—via the International Bureau—within a certain time limit, to the owner of the international registration. The notification is made *via* the International Bureau because it might be awkward, or even impossible from a legal viewpoint, for a national Office to send official communications to persons in foreign States. Naturally, this difficulty could be eliminated if the owner of the international registration were obliged to have a representative or at least an address for service in each of the designated States. However, this would always be costly for him and often completely unnecessary, especially where there is no dispute between him and the national Office. But, of course, if there is a refusal or notice of possible refusal, and the owner wants to defend his case, he will have to conform, from then on, to the national procedure, because he can only react direct, that is, not through the International Bureau. Consequently, he will have to use the remedies available under the national law in accordance with that law. This will necessitate a knowledge of the national law, the use of the official language of the national Office, and the practical if not the legal necessity of using the services of a local representative (attorney, agent, or other). See Article 18(6).

Where the address of the owner of the international registration is in the State which notifies the refusal or notice of possible refusal, the national Office could, if it so desired, send a copy of the notification to the owner. Such a copy may give the owner a few more days to react if he so desires.

*Paragraph (2)(a)(i):* See Rule 19.1 (Notifying the International Bureau; Reasons). For the definition of the date of publication, see Article 2(x).

As far as the time limit is concerned, the Draft hesitates between 12 and 15 months. The owner of the mark desires the shortest possible term to reduce the period of uncertainty. On the other hand, unless the national law provides for no or only an elementary examination, the designated Office has to go through an ex officio (ex parte) examination, and, in certain States, must announce the mark for possible third-party opposition and forward a copy of any opposition to the International Bureau. All this requires time and the question is whether it can be accomplished within 12 months, or whether a longer period (for example, 15 months) is needed.

For the case where the notification is made but the time limit is missed, see Rule 19.5 (Belated Notifications).

*Paragraph (2)(a)(ii):* See Rule 19.1 (Notifying the International Bureau; Reasons).

*Paragraph (2)(a)(iii):* See Rule 19.1 (Notifying the International Bureau; Reasons). For the definition of "final," see Article 2(viii).

The rule is that the reasons specified in the final decision of refusal must include at least one of the reasons specified in the notice of possible refusal, otherwise the notice could become a meaningless formality which would not give the applicant the required warning. However, the question arises whether it is practical to apply that rule to final decisions in court proceedings since courts may not wish to have their freedom of decision limited by any earlier administrative finding. The sentence in brackets would give them that freedom. Naturally, by pronouncing the negative decision in the form of a cancellation rather than in the form of a refusal the same result could be obtained without the additional sentence.

*Paragraph (2)(b):* This subparagraph is placed within brackets since the question whether it is really necessary is still being studied. It tries to take care of the time problem which might arise where an opposition is later amended. It would extend the 12 (or 15) months time limit to between 15 and 21 months in the case described in it.

*Paragraph (3)(a):* See Rule 19.2 (Notifying the Owner of the International Registration).

*Paragraph (3)(b):* This provision simply specifies, for a special purpose—namely, for refusals—the national treatment rule of the Paris Convention.

*Paragraph (4)(a):* See Rule 19.3 (Notification and Recording of Final Decisions of Refusal; Cancellation of the Designation, and Publication of the Cancellation).

*Paragraph (4)(b):* See Rule 19.4 (Notification Where Final Decision Results in Acceptance of the Effect Provided for in Article 11(2)).

*Paragraph (4)(c):* See the two Rules referred to in the preceding two paragraphs.

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## ARTICLE 13

### *Cancellation of the Effect Acquired Under Article 11(2)*

(1) Subject to Article 18, the effect acquired under Article 11(2) may, in respect of any designated State, be cancelled by the competent authorities of such State for the same reasons, to the same extent and subject to the same procedure as those in respect of which registrations of marks in the national register of marks may be cancelled under the national law of the said State, provided that

(i) such reasons and such procedures are not incompatible with this Treaty and the Regulations or the Paris Convention,

(ii) Article 6*quinquies* of the Paris Convention shall apply also to marks registered under this Treaty, the international registration taking the place, for the pur-

poses of that Article, of registration in the country of origin,

(iii) the competent authorities of the said State shall give, with reasonable advance notice, an opportunity to the owner of the international registration to defend his rights in the procedure and such owner shall have the same remedies against any decision of cancellation as have owners of marks registered in the national register of marks of the State in question.

(2) If the decision of cancellation is final, the national Office of the designated State shall notify the International Bureau accordingly, and that Bureau shall record that decision, cancel the designation of the said State or, in a case where the cancellation relates to some only of the goods and/or services listed, cancel—in respect of that State—those goods and/or services to which the said decision relates, and publish such cancellation.

COMMENTS ON ARTICLE 13

*Paragraph (1):* Since the international registration is a constructive national registration (see comments on Article 11(2)), it is logical that, once acquired, it should be capable of being taken away ("cancelled") for the same reasons as a "real" national registration. This is the principle enunciated in paragraph (1). It can also be regarded as a specification of the national treatment rule of the Paris Convention. It goes without saying that item (iii) does not apply in those cases in which, according to the national law, the omission of certain acts by such owner entails, *ipso facto*, cancellation of registrations.

*Paragraph (2):* This provision deals with the question how to inform all those concerned and the public at large of the fact that the designation of a State has failed because of a final decision of cancellation pronounced by the authorities of that State. See Rule 20.1 (Notification and Recording of Final Decisions of Cancellation; Cancellation of the Designation, and Publication of the Cancellation).

As to the definition of "final," see Article 2(viii).

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ARTICLE 14

*Change in the Ownership of the International Registration*

(1)(a) Subject to subparagraph (c), any change in the ownership of the international registration shall, on request, be recorded by the International Bureau, as provided in the Regulations.

(b) Subject to paragraph[s] (4) [and (5)], such recording shall have the same effect as if it had been made in the national Office of each of the designated States.

(c) If the new owner of the mark is not entitled to file international applications, this Treaty shall, with the exception of subparagraph (d), cease to be applicable to the international registration concerned unless the change in ownership is by operation of law and, pursuant to a further change in ownership occurring within two years from the first change in ownership and before the expiration of the initial term of the international registration or the then running term of renewal, as the case may be, the more recent owner is entitled to file international applications.

(d) If, pursuant to a change in ownership by operation of law, the new owner is not entitled to file international applications but is entitled under the national law of the designated State to file applications for the registration of marks in the national register of marks of that State, he shall have the right to file an application for the registration of the same mark in the said national register, and if, within two years from the change in ownership and before the expiration of the initial term of the international registration or the then running term of renewal, as the case may be, he files such an application, that application shall be treated in the said State as if it had been filed at the time when the designation of that State took effect.

(2) Where the change in ownership relates to some only of the designated States or some only of the goods and/or services listed in the international registration, the provisions of paragraph (1) shall apply only in respect of those designated States or those goods and/or services to which the change in ownership relates.

(3) Any recording effected by the International Bureau under paragraphs (1) or (2) shall be subject to the payment of a fee to that Bureau, shall be published by the said Bureau, and shall be notified by it to the old and the new owners and to the interested designated Offices, as provided in the Regulations.

(4)(a) The national law of any Contracting State may provide that the effect referred to in paragraph (1)(b) shall apply only if, within three months from the date of notification to the national Office of that State provided for under paragraph (3), evidence is adduced before such national Office for the purpose of satisfying the conditions of the national law as regards changes in ownership.

(b) Where the competent authorities of any designated State refuse the effect referred to in paragraph (1)(b), the national Office of that State shall, as provided in the Regulations, promptly notify the International Bureau accordingly, and that Bureau shall, as provided in the Regulations, record the refusal in the International Register of Marks and publish it.

[(5) The national law of of any Contracting State may provide that the effect referred to in paragraph (1)(b) shall apply only where the new owner is not a resident [*Alternative:* national] of that State.]

COMMENTS ON ARTICLE 14

*Paragraph (1)(a):* "Change in ownership" means any change in ownership, irrespective of its cause. It may be caused by reason of a contract (typically, assignment) or by operation of law (for example, inheritance). The Treaty does not regulate, and the International Bureau will not examine, the question whether a change has really occurred, in particular whether the contract transferring the property is valid and the transferee capable of owning property. These questions are left to the national law of each Contracting State. The International Bureau will merely record the change if properly requested to do so—that is, in a typical case, if requested by the person in whose name the international registration stands—and provided the new owner is the resident or national of a Contracting State. If he is not, the Treaty—which is concluded for the benefit of the residents or nationals of Contracting States—will cease to be applicable (see subparagraph (c)). As in the case of international applications, the International Bureau will rely on the allegation contained in the request: it will not examine the question whether the new owner is really a national or a resident of the State of which he alleges that he is a national or a resident. See Rule 21.1 (Request for Recording of Change in Ownership) and Rule 21.2 (Procedure Where New Owner is Entitled To File International Applications).

*Paragraph (1)(b):* This provision means essentially that even where it is possible it is not necessary to record the change in ownership anywhere else than in the International Register. Any State may, if it wishes to do so, repeat or duplicate the international registration of a mark designating it in its own national register of marks. It may, if it so wishes, also duplicate recordings of any change in ownership. But in neither case may such State require the owner of the international application to ask for such duplication of the registration or recording. Nor may it require that any fee be paid for such duplication. The recording of the change in ownership in the International Register will have the effect described in this paragraph without any further action or any payment by the new or the old owner before or to the national authorities of the designated State. However, any Contracting State may apply its national law in respect of any condition concerning change in ownership other than recording in the national register. In particular, such law may provide that, where a change in ownership relates to some only of the goods and/or services, the goods and/or services listed in connection with the new owner may not be similar to those which remain listed in connection with the earlier owner. A further example is that the national law may provide that marks may be transferred only together with the transferor's goodwill or business or that the transferee is incapable, for certain reasons, of acquiring property. This is the meaning of the second part of paragraph (4)(a). The first part of the same paragraph provides in effect that any Contracting State may require evidence that the said conditions of its national law have been met. It also provides for a time limit for presenting such evidence (three months from the notification of the recording to the designated Office). The time limit is so fixed that it should allow enough time for the assembling and forwarding of the documents constituting the evidence but still not leave third parties and the designated Office in doubt for too long a time as to whether the recording not only is formally correct but also reflects the true situation.

If any of the conditions of the national law—except, of course, any requirement that the change must be recorded

in the national register—is not met, the national authorities of the designated State may refuse the effect of the international recording of the change provided for in paragraph (1)(b) (see paragraph (4)(a)).

*Paragraph (1)(c):* As to the first part of this provision, see the comment on subparagraph (a). The second part makes provision for rendering the rule less severe. It is modelled on at least one national law. It would mean, for example, that if a person acquires the property in a mark by inheritance but happens to be a person who neither has a residence in nor is a national of a Contracting State, he would be given a certain time to transfer the property to someone who has such a residence or nationality, thereby saving both the property and the international registration.

*Paragraph (1)(d):* It appears to be only logical that persons neither residing in nor being the nationals of Contracting States should not be allowed to benefit from the Treaty. However, where the ownership of the new owner has come into existence by operation of law and, under the national law of the designated State, he may own registrations, it would seem to be equitable to allow him to switch over to the national register. See Rule 21.3 (Procedure Where New Owner Is Not Entitled To File International Applications).

*Paragraph (2):* This provision implies, of course, that a change in ownership may relate to some only of the designated States (and even to only one of them) or to some only of the goods and/or services listed in the international registration. However, such fractioning of the international registration can last only until the end of the ten-year term which is running when the change is recorded (see Article 16(4)).

This might be an appropriate place to note a definition appearing in Article 2(iv) according to which "owner of the international registration" means the natural person or the legal entity in whose name the international registration stands in respect of some or all of the designated States or some or all of the goods and/or services listed in that registration.

*Paragraph (3):* As to the fee, see Rule 21.1(c); and as to the publication and the notification, see Rule 21.2(b).

*Paragraph (4)(a):* See the comments on paragraph (1)(b).

*Paragraph (4)(b):* See the comments on paragraph (1)(b) and Rule 21.4 (Notification of Refusal; Recording and Publication).

*Paragraph (5):* This paragraph is placed between brackets since it would be needed only if Article 5(3)—also placed between brackets—is retained. It is intended to avoid the circumventing of the prohibition (should there be one) of self-designation by having the mark registered in the name of a non-resident of the country prohibiting self-designation and then having the registration transferred to a resident of such a country.

*Licenses.* It is to be noted that the Draft Treaty does not provide for the recording, in the International Bureau, of licenses (whether exclusive or non-exclusive) and "registered user declarations" as known, for example, in the UK law. Where the national law requires such recordings—so that the effect exists also vis-à-vis third parties (for example, in France)—and where the national Office "duplicates" the international registration in its national register, it will be possible to comply with the national law by having the recording effected in the national register. But where the national Office does not "duplicate" the international registration—and not only is there no obligation to "duplicate" but "duplication" may even be regarded as uneconomical—there would be no basic registration to which the recording could relate. It may, therefore, be advisable to consider whether the Treaty should not provide for the recording of licenses.

## ARTICLE 15

### *Limitation of the List of Goods and/or Services*

(1) On the request of the owner of the international registration, the International Bureau shall record, in respect of any designated State, any limitation of the list of goods and/or services which conforms with the concept of limitation as defined in the Regulations.

(2) The request for recording shall be subject to the payment of a fee to the International Bureau, and the recording shall be published by that Bureau and notified to all the interested designated States, as provided in the Regulations.

(3)(a) The International Bureau shall decline the recording of any change in the list of goods and/or services which does not conform with the said concept of limitation, and shall notify the owner of the international registration accordingly, as provided in the Regulations.

(b) In the case of a declining under subparagraph (a), the owner of the international registration may, within the prescribed time limit, file with the national Office of any designated State in respect of which the recording of the limitation was requested a petition for the purpose of requesting the International Bureau to record the said limitation in respect of that State. If the national Office or other competent authority of the said State finds that the declining by the International Bureau was unjustified under this Treaty and the Regulations, the national Office of the said State shall request the International Bureau to record the limitation in respect of that State. [It may request the International Bureau so to proceed even in the absence of any such finding.] The International Bureau shall proceed as requested.

(4) Where the national Office or other competent authority of any designated State finds that the limitation of the list of goods and/or services recorded in respect of that State is not admissible under the national law, the national Office of that State shall, as provided in the Regulations, notify the International Bureau accordingly, and that Bureau shall, as provided in the Regulations, make the appropriate annotation in the International Register of Marks and publish a notice concerning such annotation.

COMMENTS ON ARTICLE 15

*Paragraph (1):* As to the request, see Rule 22.1 (Request for Recording of Limitation of List).

It is important that only such changes be recordable as are *true* limitations. If additions or such other changes were permitted as could be regarded as extending the list of goods and/or services, the designated Offices would have to be given a new opportunity to refuse the "national registration effect" since what was acceptable in respect of a certain list might well be unacceptable under a list of a broader scope. Re-opening the refusal procedure would be too complicated. If the owner wants to cover additional goods and/or services, he will have to apply for a new registration of the mark for those additional goods ond/or services.

Deciding whether a limitation is a true limitation is not always easy if the limitation takes the form of substituting one term for another. That is why Rule 22.2 (Concept of Limitation) does not allow substitutions (and, obviously—even less so—additions) but only deletions and such qualifications of existing terms as are easy to recognize and can lead to nothing but a true limitation. A "term" may, of course, consist of several words (e.g., alcoholic beverages).

It is to be noted that no designated State is bound by any finding by the International Bureau that a requested limitation does not conform with the concept of limitation as defined in the Regulations. The competent authorities of such State have the right to disagree with the International Bureau and, consequently, may admit limitations which that Bureau has considered inadmissible or may decide not to admit limitations which it has considered admissible (see paragraph (3)).

Furthermore, where the national Office or other competent authority of any designated State has accepted a change in the list of the goods and/or services which does not conform with the provisions of Rule 22.2(a) and (b), the International Bureau will record such change. Naturally, such recording will relate to the said State only. See Rule 22.1(a)(v) and 22.2(c).

Limitation of the list of goods and/or services is also possible in combination with the request for recording later designation (see Article 6(2)(b) and Rule 11.4)). In this case, there is no need for a separate request and no fees for the limitation will be due.

*Paragraph (2):* As to the fee, see Rule 22.1(c).

As to procedure, see Rule 22.3 (Recording, Publication, and Notification, of Limitation of the List).

*Paragraph (3)(a):* See Rule 22.4 (Declining the Recording of Limitation of the List).

*Paragraph (3)(b):* See Rule 22.5 (Time Limit Under Article 15(3)(b)).

The procedure parallels that provided for in Article 9. See the comments on that Article.

*Paragraph (4):* See Rule 22.6 (Non-Admission By Designated State).

See also the last paragraph of the comments on paragraph (1).

## ARTICLE 16

### *Term and Renewal of the International Registration*

(1) The initial term of any international registration shall be ten years from the international registration date.

(2)(a) Any international registration may be renewed in respect of any designated State by its owner for terms of ten years.

(b) Renewal shall prolong the effect provided for in Article 11(2) in each designated State for the term of the renewal.

(c) Each term of renewal shall start on the day following the day on which the initial term of the international registration or the term of the last renewal expires.

(3) Renewal shall be the subject of a demand presented to the International Bureau as provided in the Regulations, and shall be subject to the payment of fees, as provided in the Regulations. The International Bureau shall record and publish the renewal and shall notify each designated Office accordingly, as provided in the Regulations.

(4) If, at the time of renewal, the owner of the international registration is not the same in respect of all the designated States or all the goods and/or services listed in the international registration, each owner shall present a separate demand.

COMMENTS ON ARTICLE 16

*Paragraph (1):* The "international registration date" is defined in Article 7(4)(a).

It goes without saying that any later designation becomes part of the international registration and thus renewal in respect of later designated States will be due at the same time as in respect of States designated in the international application itself. Consequently, for example, where the later designation took place four years after the international registration date, it will be effective only for the six remaining years of the initial term.

*Paragraph (2)(a):* This provision implies that the demand for renewal may relate to some only of the designated States.

*Paragraph (2)(b):* This provision means that the "national registration effect" will continue. Compliance with the requirements of the national law of any designated State concerning renewals is neither required nor, indeed, possible.

*Paragraph (2)(c):* As to the computation of terms, see Rule 25.2 (Periods Expressed in Years, Months, or Days).

*Paragraph (3):* The International Bureau will remind the owner of the international registration that the time for renewal is approaching (see Rule 23.1: Reminder by the International Bureau).

As to the form and contents of the demand, see Rule 23.2 (Demand for Renewal).

As to the fees, see Rule 23.3 (Renewal Fees).

As to the time limit within which the demand and the fees have to reach the International Bureau, see Rule 23.4 (Time Limits; Surcharge).

As to the recording of the renewal and its notification to the interested designated Offices, see Rule 23.5 (Recording, Publication, and Notification).

*Paragraph (4):* At the time when the international application is filed, the applicant(s) must be the same with respect to all the designated States and the list of goods and/or services must be the same with respect to all the designated States. Once the international registration is effected, ownership of it may be transferred in respect of some States only or some goods and/or services only (see Article 14(2)). Where there are different owners for the purposes of different States or for the purposes of different goods and/or services in the same State, a separate demand by each owner is needed—and this paragraph so provides—since, otherwise, one owner could prevent another owner from renewing his (the latter's) registration. On the other hand, where the same owner's registration shows different lists of goods and/or services for the purposes of different States, a single demand will suffice.

## ARTICLE 17

### *Fees*

(1) Part of the fees payable to the International Bureau in connection with the filing of international applications, requests for later designation, and demands for renewal, shall belong to the designated Offices, and part of them to the International Bureau.

(2)(a) Subject to subparagraph (b), the Regulations shall provide the details concerning the amounts of the fees, their partial reimbursement in certain circumstances, the application of the provisions of paragraph (1), and other details concerning fees payable under this Treaty.

(b) In connection with each designation and each class of goods or services named, a fee shall be payable.

COMMENTS ON ARTICLE 17

*Paragraph (1):* This paragraph states the principle according to which some of the fees belong to the designated Offices and some of them to the International Bureau. Rules 28 and 29 specify which belong to the former and which to the latter. The fees called, in Alternative A, designation fees and class fees (see Rules 9.1[A](a)(ii)(iii), 13.1[A](a)(ii), 23.3[A]) and, in Alternative B, State fees (see Rules 9.1[B](a)(ii), 13.1[B](a)(ii), 23.3[B]), would belong to the designated Offices; all others would belong to the International Bureau.

These fees would be payable in connection with the filing of international applications, requests for later designation, and demands for renewal.

The amounts of the fees will appear in what the Draft Regulations call a "Table of Fees" annexed to the Regulations. They are not indicated in that Draft. They are still being studied.

The said amounts will eventually depend on the following considerations.

*As far as the designated Offices are concerned*, the question arises whether the fees should be so fixed (i) that they cover the expenses of the designated Office connected with the handling of the international registrations in which they are designated, or (ii) that they yield, for each mark, the same revenue as each national registration earns for the national Office, or (iii) that, in either case, the national Office should receive less in order to facilitate international trade, the State economy finding compensation for the loss in revenue in the fact that its citizens spend less abroad if, by using the Treaty, they too pay less to foreign States than they would without the Treaty.

The solution under (iii) is generally looked upon with disfavor by national Offices, which, quite naturally, look at the question from the viewpoint of their own budgets. Furthermore, "subsidizing" foreign mark owners by any State seems to be out of the question even if, in return, the citizens of the same State receive the same "subsidy" abroad.

Solutions (i) and (ii) would yield the same amount of fees where the national fees exactly cover the costs. However, many Offices have budgets which show a deficit, whereas others make a profit. In these cases, solutions (i) and (ii) lead to quite different results.

A further question is whether, if solution (ii) is adopted, the fees should not be so fixed that they reflect the fact that any designated Office will have to do less work in connection with a mark already registered internationally than with a mark coming direct from the applicant. In other words, the question is whether the fees belonging to the national Offices under the Treaty should not yield less than the national fees.

Alternatives A and B are alike in this respect that they allow either solution (i) or solution (ii) to be achieved. Solution (ii) also permits a reduction in fees, if the question asked in the preceding paragraph is answered in the affirmative. Everything will depend on the actual amounts which will be fixed. The main difference between the two Alternatives is that, whereas under Alternative A the decision on the actual amounts would be made collectively by the Contracting States, under Alternative B the decision would be made separately by each Office as far as it was concerned. The advantages of the former system are of two kinds: the fees payable in respect of each designated State being the same, their computation would be greatly facilitated for the applicant; any arbitrariness in fixing the fees would be less likely. On the other hand, the advantage of allowing each Office to fix the fees individually would be that no Office could ever find itself in the position of having to accept the decision of a majority with which it disagreed.

*As far as the International Bureau is concerned*, the amounts of all the important fees would be fixed by the Assembly of the Contracting States, since they would be fixed in the Regulations (in the "Table of Fees" annexed to the Regulations), the Regulations being amended by the Assembly (Article 104(3)(a)), and in this respect by a two-thirds vote (Article 104(3)(b)). Minor fees and charges (for example, for delivering copies) would be fixed in the Administrative Instructions, that is, by the Director General under the control of the Assembly (see Article 104(1)(b)).

As to the principle which should guide the Assembly in fixing the amount of the fees belonging to the International Bureau, Article 103(4)(a) provides that "the amounts of fees and charges due to the International Bureau and the prices of its publications shall be so fixed that they should, under normal circumstances, be sufficient to cover the expenses of the International Bureau connected with the administration of this Treaty."

Among these fees, by far the most important—because they are expected to represent more than 90% of all the revenues of the International Bureau in fees and charges—are what are called in Alternative A the basic fees (see Rules 9.1[A](a)(i), 13.1[A](a)(i), 23.3[A], and in Alternative B the international fees (see Rules 9.1[B](a)(i), 13.1[B](a)(i), 23.3[B](a)(i)). These fees, payable in connection with the filing of international applications, requests for later designation, and demands for renewal, are intended to cover the expenses of the International Bureau connected with checking the applications, requests and demands, preparing the material for publications, printing the Gazette, notifying the designated Offices, and other related tasks.

*Paragraph (2)(a):* The *amounts* of all major fees will be shown in the Table of Fees annexed to the Regulations; the amounts of minor fees will be given in the Administrative Instructions; and, if Alternative B is adopted, the amounts of the fees belonging to each national Office will be published in the Gazette.

*Partial reimbursement* is provided for in Rules 14.4 (Notification, and Reimbursement of Certain Fees, Under Article 7(3)), 15.4 (Notification, and Reimbursement of Certain Fees, Under Article 8(3)), and 23.7 (Reimbursement of Certain Fees): where the International Bureau declines the international application or the request for recording of a later designation, the fees belonging to the designated States would be reimbursed since, because of the fact that the international application or the request for recording of a later designation has been declined, they would *not* be designated States and would have no work to perform. The fees belonging to the International Bureau would not be reimbursed since that Bureau would have performed the task of checking and conducting correspondence with the applicant, a task that is frequently more costly than in a routine case because the cases involved would be those where the application or request had defects.

*As to the application of paragraph (1)*, see the comments on that paragraph as well as Rules 28 (Fees Belonging to the Designated Offices) and 29 (Fees Belonging to the International Bureau).

As to *other details*, see Rule 26 (Payment of Fees).

*Paragraph (2)(b):* This paragraph enunciates the principle according to which fees will be payable for each designation of a State and for each class of the goods and/or services listed. The amount of the fees will be the same for each designation and each class if Alternative A is adopted; under Alternative B, these fees could and probably would vary from State to State (see the comments on paragraph (1), above). If Alternative B is adopted, the words "and each class of goods or services named" will have to be omitted since, under that Alternative, each designated State may or may not charge a fee per class.

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## ARTICLE 18

### *Certain National Requirements*

(1) [*Fees*] No national Office of any designated State shall, unless acting as an independent review authority, require the payment of fees other than those provided for under this Treaty in connection with the obtaining or renewing of international registrations and recordings under this Treaty and the effects of such registrations and recordings in the said State.

(2) [*Number of Classes and of Goods and/or Services*] No designated State may refuse or cancel the national registration effect merely on the grounds that its national law allows the registration of marks only in respect of a limited number of classes or a limited number of goods and/or services.

(3)(a) [*Actual Use*] The national law of any Contracting State may impose the same conditions as are applicable to marks whose registration is applied for or which are registered in the national register of marks in that State in respect of any requirement that the owner of an international registration use the mark in that State or in any other place, provided that such State shall not refuse under Article 12, cancel under Article 13, or otherwise fail to accord the effects of the international registration as defined in Article 11, on the ground that the mark has not been used at any time prior to the expiration of [*Alternative A*: three] [*Alternative B*: five] years counted from the international registration date or the recording date of the later designation, as the case may be. However, the national law of any Contracting State may provide that any action for infringement based upon an international registration may be started only after the owner of such international registration has commenced the continuing use of the mark in the said State and that any remedy resulting from such action shall relate only to the period after such use has commenced.

(b) [*Actual Use: Continued*] Where prior to the international registration date or the recording date of the later designation, as the case may be, the mark has been registered in the national register of marks of any designated State or has been the subject of an application for registration in that register, the proviso of subparagraph (a) shall not apply to the exent that the said registration or application relates to the same goods and/or services as are listed in respect of such State in the international registration. However, where the application for registration in the national register was filed less than [*Alternative A*: three] [*Alternative B*: five] years before the international registration date or the recording date of the later designation, as the case may be, the proviso of subparagraph (a) shall apply, but only during the period between such date and the expiration of the [*Alternative A*: third] [*Alternative B*: fifth] year counted from the date on which the said application was filed. The present subparagraph shall also apply where the earlier registration is one effected in the International Register under the Madrid Agreement or the present Treaty.

(c) [*Declaration of Actual Use*] Where one of the conditions of the national law of the designated State referred to in subparagraph (a) consists of a requirement, general in the sense that it is applicable to all marks registered in the national register of marks of that State, that a declaration stating that the mark is or is still in use in that State must be filed with its national Office at certain points in time or in connection with each renewal or other specific event ["routine declaration"], such declaration may in the form prescribed by the national law of that State [or in the form as prescribed in the Regulations] be filed with the International Bureau and shall have tne same effect as if it had been filed with the national Office of that State on the date on which it was received by the International Bureau. Such declaration shall be promptly forwarded by the International Bureau to the said national Office. The said effect shall not be denied on the ground that the declaration was not accompanied by any required supporting evidence, or that the evidence accompanying it was insufficient, without the said national Office's giving the owner of the international registration an opportunity to produce or complete before it any required evidence within not less than three months after having notified the said owner or his duly appointed representative that evidence or additional evidence is required. The present subparagraph shall not apply in inter partes and other proceedings in which the requirement is not a general one in the sense indicated above ["ad hoc requirement"].

(d) [*Declaration of Actual Use: Continued*] No requirement referred to in subparagraph (c) shall be applicable prior to the expiration of the time limit referred to in the proviso of subparagraph (a), subject, where applicable, to subparagraph (b).

(4) [*Intent to Use*] (a) Any Contracting State may apply its national law requiring that applicants file a declaration with its national Office to the effect that they intend to use the mark provided that such requirement shall be considered to have been complied with if a declaration in the form specified in the Regulations to the effect that the applicant or owner of an international registration intends to use the mark in that State is contained in the international application or request for the recording of the later designation, as the case may be.

(b) The International Bureau shall, as provided in the Regulations, notify the national Office of any designated State in respect of which a declaration under subparagraph (a) was filed with that Bureau of such declaration.

(5) [*Provisions common to paragraphs (3) and (4)*] Whenever paragraphs (3) and (4) refer to use of the mark by the applicant or the owner of the international registration, use by a person whose use, under the applicable national law, inures to the benefit of the applicant or owner shall be sufficient for invoking the benefits provided for in the said paragraphs.

(6) [*Representation*] No designated State shall require that the applicant or the owner of the international registration be represented by any natural person or legal entity located in that State or that, for the purposes of serving notices on such applicant or owner, an address in that State be indicated, except where the applicant or owner is involved in a proceeding before the national authorities of the said State and, where applicable, after the refusal or notice of possible refusal has been notified by the designated Office to the International Bureau as provided in Article 12(2)(a)(i).

COMMENTS ON ARTICLE 18

*Paragraph (1):* International registration and renewal being *in lieu of* national registration and renewal, the fees paid under the Treaty and belonging to the designated Offices should compensate them for not collecting national fees.

The fees paid under the Treaty exempt the applicant or owner of the international registration from paying any national fee which otherwise would be due to any national Office for "the obtaining or renewing . . . the effects of such [international] registrations and recordings [under the Treaty] in the said [i.e., the designated] State." The reference to "obtaining" is intended to cover *all* fees leading to registration, that is—depending on the national laws—filing fees, registration fees, grant fees, publication fees, class fees, fees payable in an opposition procedure by the applicant, and any other fees, but, of course, *not* fees payable by the opposer in any opposition proceeding and *not* fees payable by the petitioner in any cancellation proceeding (since these are not fees payable by the

owner of the international registration). The reference to "renewing" is intended to cover *all* fees connected with the prolongation of the registration, that is—depending on the national laws—renewal fees, recording fees, publication fees, and any other fees. In both cases, only fees concerning national Offices are meant, and *not* fees payable by any party in any proceeding before a court or other independent review authority.

*Paragraph (2):* Some national laws provide that for each different class a separate registration is required, or that each registration may relate to only a given number of goods and/or services (for example, ten). Such provisions could not be held against an international registration. The amount of the fees payable under the Treaty depending, among other things, on the number of classes to which the goods and/or services belong, the fee aspects of the said national laws would be taken care of partly if not always wholly.

*Paragraph (3)(a):* The national laws of some States provide that a mark must be used before an application concerning it may be filed, or before the registration concerning it may be granted. Some national laws provide that the registration must be cancelled if the mark is not used within a specified period of time. Some national laws provide for the cancellation of marks which have been abandoned and establish a presumption of abandonment when the mark is not used for a specified period and its non-use is not excusable.

Under the Treaty these provisions would also apply—subject to paragraph 3(c)—to marks which are the subject of international registration to the same extent as they are applicable to the marks registered nationally in that State, but with an important qualification: *non-use* at any time prior to the expiration of a *certain number of years*—the Draft hesitates between three and five—could not be a ground for refusing the international registration effect, for cancelling it or for otherwise impairing it. The period would count from the international registration date or the recording date of the later designation, as the case may be, that is, from the date which, for the purposes of the interested State, is the "filing date."

As stated in the second sentence of subparagraph (a), even though the national registration effect in a State cannot be refused, cancelled or otherwise impaired on the ground of non-use during the three-year or five-year period, the national law of any Contracting State could provide that any action for infringement may not be started until the owner has commenced use of the mark in that State and any remedy resulting from such action could relate only to the period after the said owner has started use. For example: the owner starts to use the mark as from the second year after the international registration; during the third year after such event, he sues for damages a person who has started to use a similar mark just after the international registration date of his mark and is still using it; the national law may provide that the plaintiff will recover damages only as from the second year.

It goes without saying that provisions of any national law excusing non-use even beyond the three-year or five-year period—for example, because the owner of the mark for a pharmaceutical product cannot use it before the authorization of the health authorities is granted—would remain applicable by virtue of the national treatment provisions of the Paris Convention. Such justified non-use, where it is of relevance, would have to be proved according to the national law of each designated State direct before the competent national authorities of such State, without the intermediary of the International Bureau.

Of course, nothing in the Treaty could prevent the national law of any Contracting State from requiring at any time, from the owner of an international registration, evidence of use in any proceeding where such evidence is relevant or necessary under such national law to overcome a ground *other than non-use* for refusing under Article 12, or cancelling under Article 13, the effects of the international registration as defined in Article 11. For example, if registration is refused or cancelled on the ground that the mark is descriptive (or, in the British law, not distinctive) and that ground, in the given case, can be overcome only where the applicant or owner shows that the mark has acquired a secondary meaning (or, as in the British law, that it has been adapted to distinguish or is capable of distinguishing) by reason of use of the mark, evidence of use could be required, but only to overcome the said ground, which is a ground other than non-use.

*Paragraph (3)(b):* This provision relates to the situation where a mark has been the subject of a national application or registration and is later the subject of an international registration *cum* designation. The three-year or five-year moratorium would apply only if the national registration took place within the three or five years preceding the international registration or later designation and only for the period between such registration or designation and the end of a three-year or five year period counted from the national filing date.

*Paragraph (3)(c):* Some national laws require not only that a mark be used but also that the owner of the mark file with the national Office at a certain point in time or from time to time (as fixed in that law) a declaration ("routine declaration") that the mark is (still) used. The Treaty leaves any such requirement intact, subject to two exceptions. One is that such a requirement cannot, obviously, be applied during the three-year or five-year moratorium provided for in paragraph (a) (see subparagraph (d)). The other is that any routine declaration could be filed with the International Bureau rather than the national Office (see the subparagraph under consideration). The question when such routine declarations are due will depend on the national law but the national Office will provide and the International Bureau will publish the necessary information (see Rule 23*bis*.1: Information Concerning Requirements Under Article 18(3)(c)). On the question of the form of the declaration, the Draft hesitates between two solutions. One—*without* the words in brackets—would mean that the declaration must be in the language and in the form prescribed by the national law of the State which the declaration concerns ("national forms"). The other—*with* the words in brackets—would mean that the owner may use either the said national form or an "international form" in the language of the international application. (See Rules 23*bis*.2: National Forms and 23*bis*.3: International Forms.) Both kinds of forms would be put at the disposal of the owner of the international registration, free of charge. In any case, the declaration would be transmitted by the International Bureau to the designated Office. A further advantage provided for is that where evidence is required and does not accompany the declaration (it may accompany it but does not have to do so) or is insufficient, the national Office will give three months for filing or completing such evidence.

It is to be noted that the said facilities apply only to "routine declarations" and not to any declaration which is needed on an ad hoc basis. For example, when non-use is alleged in a cancellation proceeding dealing with a specific mark, in order to overcome such allegation it may well be necessary to make a statement of use. Another example is the declaration of use provided for in the US law as one of the conditions for obtaining incontestability of the owner's right to use the mark: no owner is required to seek such incontestability but, if he wishes to do so, he will, among other things, have to file a declaration alleging continued use for a period of five years subsequent to registration.

*Paragraph (3)(d):* This provision means that neither general nor ad hoc declarations could be required during the three-year or five-year moratorium.

*Paragraph (4)(a):* Some national laws provide that at the time a person files an application for the registration of a mark he must have a *bona fide* intent to use the mark in the country and that a declaration to that effect must be filed with the national Office. The requirement for a declaration to be filed with the national Office would be inapplicable or, rather, it would be replaced by a declaration to the same effect filed with the International Bureau. Rules 6.3 (Declaration of Intent To Use the Mark) and 11.2 (Declaration of Intent To Use the Mark) provide for the details where the declaration is made in connection with the international registration or a later designation, as the case may be, and contain a suggested wording for the declaration which would be recognised by all Contracting States. The wording does not include the expression "*bona fide*" since, at least in civil law countries, it goes without saying that a solemn declaration producing legal effects is not a declaration if it is not made in good faith. The substantive requirement of the national law that the intent to use must exist would be left unaffected by the Treaty. Consequently, where the applicant or owner does not, *in fact*, intend to use the mark, the registration effect may be taken away by any designated State requiring intent to use, it may do so notwithstanding the existence of the—false—declaration, and may do so at any time, even before the three-year or five-year period referred to in paragraph (3)(a) expires.

*Paragraph (4)(b):* See item (iii) of Rule 18.1 (Form of Notifications).

*Paragraph (5):* This provision means that, in any routine declaration of actual use (paragraph (3)(c)) and in any declaration of intent to use (paragraph (4)(a)), the alleged use may be either direct (that is, by the owner of the international registration or by the applicant, respectively) or indirect (that is, by a person whose use inures to the benefit of such owner or applicant).

*Paragraph (6):* Since the international application is filed with the International Bureau (see Article 3(2)) and since any notice of possible refusal or refusal under Article 12 is notified to the International Bureau (see Article 12(2)(a)(i)), there is no need for direct contact between the applicant or owner of the international registration and the designated Office. However, once the notice of possible refusal or the refusal has been notified to the said owner and the latter contests it, any further contact between the owner and the national authorities (administrative or judicial) will be direct—since the Treaty does not provide for such contacts through the International Bureau—and for such direct contact the designated Office may wish to require that the owner be represented by a local agent or have an address for service in the State concerned.

## ARTICLE 18*bis*

### *Certain Changes Recorded by National Offices*

(1) Where the national Office of any designated State has recorded in its own records any change in respect of any mark which is registered in the International Register of Marks, such Office shall, as provided in the Regulations, promptly notify the International Bureau of such recording unless the said recording has been made pursuant to a notification by the International Bureau to such national Office.

(2) The International Bureau shall, as provided in the Regulations, make the appropriate annotation in the International Register of Marks and publish a notice concerning such annotation.

### COMMENTS ON ARTICLE 18*bis*

*Paragraph (1):* This Article was provisionally given a "*bis*" number in order not to have to change the numbering of the Articles as they appeared in the last series of documents.

The Treaty does not require any Contracting State to enter in its national register marks which, by virtue of the Treaty, have a national registration effect in that State. (Such effect exists by virtue of the Treaty, in particular, under Article 11(2), whether such marks are entered in the national register or not.) But the Treaty does not prohibit the entering of such marks in its national register. If any country chooses to make such entries, that is, to "repeat" the international registration in its national register, it may be that certain changes affecting the mark only in that State will be entered in the national register without the owner's asking for their recording by the International Bureau. For example, ownership of the mark or the list of goods and/or services may change in that State. If such changes are entered in the national register without the owner's asking for them to be recorded in the International Register of Marks, the latter would not reflect them. Such a situation is undesirable since the International Register of Marks would then become incomplete and third parties could not entirely rely on it. It is to avoid this situation that the provision is proposed: any change "directly" entered would have to be promptly communicated to the International Bureau by the national Office, and the International Bureau would reflect it in the International Register of Marks and the International Marks Gazette.

Rule 29*bis* (Changes in the National Register) deals with the procedure.

It is recognized that there is no sanction for the case where the national Office does not comply with the obligation provided for in this paragraph. But since non-compliance would amount to violating an obligation assumed under the Treaty, it is reasonable to expect that the obligation will generally be respected.

*Paragraph (2):* See Rule 29*bis* (Changes in the National Register).

In certain cases, the change could only with great difficulty be recorded in all its details in the International Bureau, primarily because of language problems (for example, where the change is in the list of goods and/or services). In such cases, probably only the fact that a change has been entered in the national register and an indication of the nature of the change will be all that is practicable for the purposes of international annotation and publication. The details will be regulated in the Administrative Instructions (see Rule 29*bis*.2).

## ARTICLE 19

### *Preservation of Rights Acquired Through National Registration*

(1) If, at the international registration date or the recording date of the later designation, as the case may be, the owner of the international registration of a mark owns, in any designated State, a registration of the same mark in the national register of marks ("national registration"), his rights under this Treaty shall be deemed to include all rights, particularly any priority rights, existing under that national registration, and to continue to include them even where the national registration subsequently expires. The foregoing provision shall apply to the extent that the goods and/or services referred to in respect of the said State in the international registration are the same as the goods and/or services referred to in the said national registration.

(2) The applicant or the owner of the international registration of a mark may, as provided in the Regulations, file a declaration alleging that he owns national registrations of the same mark in certain designated States and identifying such registrations and the goods and/or services to which each of them relates. Once the international registration or the recording of the later designation has been effected in respect of the said States, the International Bureau shall record and publish the declaration and shall notify any interested designated Office accordingly, as provided in the Regulations. That Office shall refer to the declaration in the national register of marks in connection with the said national mark.

(3)(a) Where a declaration under paragraph (2) has been notified to the designated Office and the conditions referred to in paragraph (1) are complied with, and to the extent that they are complied with, the effect provided for in Article 11(2), may not, subject to subparagraph (b), be refused under Article 12.

(b) Where, in any designated State, there is more than one national register of marks and the national registration referred to in paragraph (1) exists in a national register which affords less than the highest degree of protection, subparagraph (a) shall apply only if the declaration under paragraph (2) relates to a registration in the same national register.

COMMENTS ON ARTICLE 19

*Paragraph (1):* This paragraph deals mainly with the situation in which the owner of a mark switches over from protection by virtue of national registration to protection by virtue of international registration *cum* designation under the Treaty. It is essential that he suffer no prejudice because of such switchover, and that is what this provision and paragraph (3) accomplish. The reason for which the owner of a mark may desire such a switchover is that under the Treaty the surveillance of his mark becomes much simpler, and generally also much cheaper, if for no other reason than that renewals valid in a number of States can be made at regular (ten-year) intervals, in one place (the International Bureau), according to a centrally (in the Gazette) publicized fee schedule, by payment in one currency (Swiss) by a single transfer, subject to the simplest single formality (filling in one form), and without the need of any intermediary.

The paragraph provides that the effect of the switchover is that the rights under the national registration are deemed to be included and continue to be deemed to be included in the international registration even if the national registration subsequently expires, in particular because it has not been renewed.

*Paragraph (2):* As to the declaration, see Rule 6.4 (Declarations Under Articles 19(2) and 20(2)), dealing with declarations relating to international registration and Rule 11.3 (Declarations Under Articles 19(2) and 20(2)), dealing with declarations relating to later designations.

As to recording the declaration, see Rule 3.1 (Keeping of the Register).

As to publishing the declaration, see Rules 17.1(a)(x) (Contents of Publication of International Registrations) and 17.2(a)(vi) (Contents of Publication of Recordings of Later Designations).

As to notifying the declaration, see Rule 18.1 (Form of Notifications [of International Registrations and Recordings of Later Designations]), by virtue of which everything that is published is also separately notified to each interested designated State.

The last sentence of this paragraph provides that the declaration shall be referred to in the *national* register in connection with the national mark on the basis of which the switchover took place. This is important because it means that anybody consulting the national register will be alerted to the fact that mere failure to renew the national registration does not necessarily mean that the protection has ceased.

*Paragraph (3)(a):* The words "to the extent that they [the conditions referred to in paragraph (1)] are complied with" are intended to emphasize that the provision applies only to the extent to which the goods and/or services listed in the national registration are the same as those which are listed in the international registration.

See also the comments accompanying Article 12(1).

*Paragraph (3)(b):* This subparagraph deals with the situation contemplated in Article 11(3) (see the comments thereon) and means that, for example, if a person owns a mark registered in the Supplemental Register of the U.S. Patent Office and later switches over to an international registration *cum* designation of the United States of America, such designation shall not be subject to the possibility of refusal only if it is connected with the indication of the Supplemental Register (see Rule 6.5: Option Under Article 11(3)).

## ARTICLE 20

### *Preservation of Rights Acquired Through International Registration Under the Madrid Agreement*

(1) If, at the international registration date or the recording date of the later designation, as the case may be, the owner of the international registration of a mark effected under this Treaty owns, in respect of any designated State, an international registration effected under the Madrid Agreement ("Madrid registration"), his rights under this Treaty shall be deemed to include all rights, particularly any priority right, existing under that Madrid registration and to continue to include them even where the Madrid registration subsequently expires. The foregoing provision shall apply to the extent that the goods and/or services referred to in respect of the said State in the international registration under this Treaty are the same as the goods and/or services referred to in respect of the said State in the Madrid registration.

(2) The applicant seeking the international registration of a mark under this Treaty, or the owner of the international registration of a mark under this Treaty, may, as provided in the Regulations, file a declaration alleging that he owns a Madrid registration of the same mark in respect of certain designated States and identifying such registration and the goods and/or services to which such

registration relates in each such State. Once the international registration or the recording of the later designation has been effected in respect of the said States, the International Bureau shall record and publish the declaration and shall notify any interested designated Office accordingly, as provided in the Regulations.

(3) Where a declaration under paragraph (2) has been notified to the designated Office and the conditions referred to in paragraph (1) are complied with, and to the extent that they are complied with, the effect provided for in Article 11(2) may not be refused under Article 12, unless protection under the Madrid Agreement has been refused or as long as refusal under that Agreement is still possible.

COMMENTS ON ARTICLE 20

*Paragraphs (1) (2) and (3):* This Article has the same content as Article 19, except that it deals with the preservation of rights acquired not through national registration but through international registration under the Madrid Agreement.

Consequently, the comments made in connection with Article 19 apply also to this Article, *mutatis mutandis*.

The switchover is facilitated in certain circumstances through exemption from certain fees (see Rule 9.3: Exemption from Certain Fees).

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## ARTICLE 20*bis*

*Preservation of the Right To Use the Madrid Agreement*

Where any natural person or legal entity has the right to seek international registration under the Madrid Agreement or to renew his or its international registration under that Agreement, such right shall not be affected by this Treaty in any Contracting State party also to the Madrid Agreement.

COMMENTS ON ARTICLE 20*bis*

*Sole paragraph.* This Article was provisionally given a "*bis*" number in order not to have to change the numbering of the Articles as they appeared in the last series of documents.

The proposed Treaty will not replace the Madrid Agreement, not even among States which will be party to both instruments. Where any applicant or owner of a mark is a national or a resident of a State party to both instruments, he will have the freedom to choose and may use, for the purposes of protection in other States that are also party to both instruments, either of the two instruments. The freedom to choose the Madrid Agreement is spelled out in this Article. The freedom to choose the present Treaty—which will be the more recent one—goes without saying.

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## ARTICLE 21

*Regional Marks*

(1) The provisions of this Treaty shall also apply, *mutatis mutandis*, where marks have effect, by virtue of a regional treaty, in one or more States under such regional treaty.

(2) The implementation of the principle laid down in paragraph (1) shall be provided for in the Regulations for the purposes of any present or future regional treaty concerning marks.

COMMENTS ON ARTICLE 21

*Paragraph (1):* The intent of this Article is to provide the possibility of using this Treaty to obtain the effect of a regional mark registration.

*Paragraph (2):* Rule 32 is reserved for the purpose specified in this paragraph.

However, no draft is proposed for Rule 32 at the present time. Proposals will be made only after consultation in particular with those two regional offices which, for the moment, are the only ones falling under the definition of this paragraph, namely, the African and Malagasy Industrial Property Office (in Yaoundé, Cameroon; commonly called "OAMPI") and the Benelux Trademark Office (in the Hague, Netherlands).

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## ARTICLE 22

*Representation Before the International Bureau*

(1) Applicants and owners of international registrations may, as provided in the Regulations, be represented before the International Bureau by any natural person or legal entity empowered by them to that effect (hereinafter referred to as "the duly appointed representative").

(2) Any invitation, notification or other communication addressed by the International Bureau to the duly appointed representative shall have the same effect as if it had been addressed to the applicant or the owner of the international registration. Any application, request, demand, declaration or other document whose signature by the applicant or the owner of the international registration is required in proceedings before the International Bureau, except the document appointing the representative or revoking his appointment, may be signed by his duly appointed representative, and any communication from the duly appointed representative to the International Bureau shall have the same effect as if it had been effected by the applicant or the owner of the international registration.

(3)(a) Where there are several applicants and they have not appointed a common representative as provided in the Regulations, the applicant first named in the international application shall be considered the duly appointed representative of all the applicants.

(b) Where there are several joint owners of an international registration and they have not appointed a common representative as provided in the Regulations, the natural person or legal entity first named among the said owners in the International Register of Marks shall be considered the duly appointed representative of all the joint owners of the international registration.

COMMENTS ON ARTICLE 22

*Paragraph (1):* See Rules 2.1 (Number of Duly Appointed Representatives), 2.2 (Form of Appointment), 2.3 (Revocation, Lapse, or Renunciation of Appointment).

This provision means that any person may represent an applicant or owner of an international registration before the International Bureau. The representative may be not only a trademark agent or attorney but also one of the employees of the applicant or owner, or any other person, including a legal entity, and no requirements as to professional qualifications may be prescribed. Of course, if and when any act has to be accomplished before a national Office, the national law applicable to that Office will govern and, consequently, it will frequently be necessary that the representative be a qualified trademark attorney or agent residing in the country in which that national Office is located.

*Paragraph (2):* According to the first sentence, where, for example, the Treaty provides that the International Bureau has to (i) invite the applicant to sign the international application or pay the missing part of the fee (Article 7(2)), (ii) notify the applicant if it declines the international application (Article 7(3)) or if it receives from a designated State a notice of refusal or possible refusal (Article 12(3)(a)), or (iii) notify the owner of the international registration if it rejects a request for changing the list of goods and/or services (Article 15(3)(a)), the said Bureau will send the invitation or notification to the duly appointed representative (rather than the applicant or the owner of the international registration) and thus will have complied with the requirements of the Treaty.

According to the second sentence, the duly appointed representative, instead of the applicant or the owner of the international registration, may, for example, sign the International application, any request for recording a later designation or a change in ownership or a change in the list of goods and/or services, any demand for renewal, any declaration of intent to use, or any declaration of actual use.

*Paragraph (3)(a):* See Rule 2.1(a), which provides that, if there are several applicants or joint owners of the international registration, they may appoint only one representative. "Joint owners of the international registration" are defined in Article 2(v) as "natural persons or legal entities in whose names the international registration stands for the purposes of the same designated States and the same goods and/or services."

*Paragraph (3)(b):* See the comments on paragraph (3)(a).

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## ARTICLE 23

*Effect of Priority Claim Contained in International Application or in Request for Later Designation*

The effect of any declaration of priority made in the international application or in the request for recording of later designation shall be as provided for in respect of marks in the Paris Convention.

COMMENTS ON ARTICLE 23

*Sole Paragraph:* The international application or any request for later designation may contain a declaration claiming the priority of one or more earlier applications filed in any country party to the Paris Convention or of one or more earlier filings that are equivalent to regular national filings within the meaning of that Convention (see Articles 5(1)(b) and 6(2)(b)). Rule 6.2 (Claiming of Priority) regulates the details for making the declaration of priority effective in respect of all of the States designated in the international application. Rule 11.1 (Claiming of Priority) provides for the same in respect of any later designated State.

The Paris Convention regulates the effect of the right of priority in Article 4B.

## ARTICLE 24

### *International Application as Possible Basis of Priority Claim*

(1) Any international application which is regular shall be equivalent to a regular national filing within the meaning of the Paris Convention and shall be recognized as the basis of a priority claim as provided for in that Convention.

(2) For the purposes of paragraph (1), an international application shall be regarded as regular unless it has been declined by virtue of Article 7(3) and shall be regarded as having been filed on the international registration date.

COMMENTS ON ARTICLE 24

*Paragraph (1):* This Article makes the international application the possible basis of a priority claim. Since, under the Treaty, international applications may be filed without or before the existence of any national filing (except in the case contemplated in Article 5(3)(i)), international applications will frequently be "first" applications, and it will be useful to invoke their priority in States which cannot be designated (because they are not party to the Treaty) or which, for one reason or another, are not designated although they could be designated.

The Paris Convention provides that "any filing that is equivalent to a regular national filing . . . under . . . multilateral treaties concluded between countries of the Union shall be recognized as giving rise to the right of priority" (Article 4A(2)).

The paragraph under consideration provides that a regular international filing comes within the scope of the quoted provision of the Paris Convention.

*Paragraph (2):* This paragraph specifies the conditions which an international application must satisfy to constitute a "regular" filing and defines the date of filing.

The provision means in effect that the international filing cannot be regarded as irregular if it has led to an international registration. Any national law may, of course, recognize, for priority purposes, even international applications which have been declined.

## ARTICLE 25

### *Delay in Meeting Time Limits*

(1) Any Contracting State shall, as far as that State is concerned, excuse, for reasons admitted under its national law, any delay in meeting any time limit fixed in this Treaty or the Regulations.

(2) Any Contracting State may, as far as that State is concerned, excuse, for reasons other than those admitted under its national law, any delay in meeting any time limit fixed in this Treaty or the Regulations.

(3) Paragraphs (1) and (2) shall not apply to any delay in meeting any time limit provided for in Article 12(2).

COMMENTS ON ARTICLE 25

*Paragraph (1):* A typical reason for which national laws excuse delays in meeting time limits is *force majeure*. Thus, for example, if, according to the national law of a Contracting State, a postal strike is considered *force majeure* and, because of that strike, the missing signature on a request for the recording of the later designation of that State is furnished after the expiration of the time limit fixed in Article (8)(2), the national Office of that State will, on the request of the owner of the international registration, have to request the International Bureau to proceed with the recording of the designation (see Article 9(2)).

*Paragraph (2):* If, for example, the delay is not due to *force majeure* but—to modify the example given above—is caused by the late arrival in the mail of the signature, for no apparent reason, the designated State may, if it so wishes, proceed as outlined in the above example.

*Paragraph (3):* The time limit provided for in Article 12(2) is the time limit for notifying refusals or notices of possible refusals to the International Bureau. Excusing delays in meeting that time limit would mean that the Contracting State would be excusing its own delay. This would seem to be going too far, particularly since it would create uncertainty both for the owner of the mark and for third parties over an indefinite period of time.

# CHAPTER II: ADMINISTRATIVE PROVISIONS

## ARTICLE 101

### *Assembly*

(1)(a) The Assembly shall consist of the Contracting States.

(b) The Government of each Contracting State shall be represented by one delegate, who may be assisted by alternate delegates, advisors, and experts.

(2)(a) The Assembly shall:

(i) deal with all matters concerning the maintenance and development of the Union and the implementation of this Treaty;

(ii) exercise such rights and perform such tasks as are specially conferred upon it or assigned to it under this Treaty;

(iii) give directions to the Director General concerning the preparation for revision conferences;

(iv) review and approve the reports and activities of the Director General concerning the Union, and give to him all necessary instructions concerning matters within the competence of the Union;

(v) determine the program and adopt the budget of the Union, and approve its final accounts;

(vi) adopt the financial regulations of the Union;

(vii) establish such committees and working groups as it deems appropriate to facilitate the work of the Union and of its organs;

(viii) determine which States other than Contracting States and which intergovernmental and international non-governmental organizations shall be admitted to its meetings as observers;

(ix) take any other appropriate action designed to further the objectives of the Union and perform such other functions as are appropriate under this Treaty.

(b) With respect to matters which are of interest also to other Unions administered by the Organization, the Assembly shall make its decisions after having heard the advice of the Coordination Committee of the Organization.

(3) A delegate may represent, and vote in the name of, one State only.

(4) Each Contracting State shall have one vote.

(5)(a) One-half of the Contracting States shall constitute a quorum.

(b) In the absence of the quorum; the Assembly may make decisions but, with the exception of decisions concerning its own procedure, all such decisions shall take effect only if the quorum and the required majority are attained through voting by correspondence as provided in the Regulations.

(6)(a) Subject to the provisions of Article 103 (5)(f), Article 104(3)(b) and (c), and Article 107(2)(b), the decisions of the Assembly shall require a majority of the votes cast.

(b) Abstentions shall not be considered as votes.

(7)(a) The Assembly shall meet once in every calendar year in ordinary session upon convocation by the Director General, preferably during the same period and at the same place as the Coordination Committee of the Organization.

(b) The Assembly shall meet in extraordinary session upon convocation by the Director General, either on the Director General's own initiative or at the request of one-fourth of the Contracting States.

(8) The Assembly shall adopt its own rules of procedure.

COMMENTS ON ARTICLE 101

*Paragraph (1)(a):* "The States party to this Treaty" (Article 1(1)) are the Contracting States.

*Paragraph (1)(b):* See Rule 101.1 (Expenses Born by Governments), according to which the expenses of each Delegation are borne by the Government which the Delegation represents.

*Paragraph (2)(a):* This paragraph enumerates some of the main tasks of the Assembly. The Assembly is the principal organ of the Union, in which all Contracting States are represented (paragraph (1)(a)) and have equal rights (paragraph (4)). The Draft provides for only one other organ and that is the secretariat, called the "International Bureau," headed by the Director General (see Article 102). The International Bureau is the secretariat of the World Intellectual Property Organization (WIPO), with headquarters in Geneva, Switzerland (see Article 2). WIPO administers several intellectual property Unions, including the Paris Union, the Madrid Union, and, once it comes into effect, the Union created by the Patent Cooperation Treaty (PCT).

As to the reasons for not proposing the creation of an Executive Committee, see the comments on paragraph (7)(a).

*Paragraph (2)(b):* The Coordination Committee of WIPO is composed of the members of the Executive Committee of the Paris Union and the members of the Executive Committee of the International (Berne) Union for the Protection of Literary and Artistic Works.

*Paragraph (3):* In other words, no person can represent two or more member States.

*Paragraph (4):* This provision ensures equality among the member States.

*Paragraph (5)(a):* This provision is qualified in subparagraph (b), which provides that decisions can be made also in the absence of a quorum: decisions of a procedural nature made in the absence of a quorum are unconditionally valid, whereas all other decisions made in the absence of a quorum and of the required majority obtained effect after what amounts to a continuation—by correspondence—of the voting.

*Paragraph (5)(b):* See the comments made in connection with the preceding subparagraph. See also Rule 102.1 (Voting by Correspondence).

*Paragraph (6)(a):* Article 103(5)(f) deals with the majority required for decisions concerning the working capital fund. Article 104(3)(b) and Article 104(3)(c) deal with the majorities required for amending the Regulations, a matter within the power of the Assembly. The majorities are two-thirds for some provisions and three-fourths for others.

Article 107(2)(b) deals with the majorities required for amending certain provisions (some administrative provisions and the length of the time limit for notifying refusals and warnings) of the Treaty, a matter within the power of the Assembly. The required majority is three-fourths for the said administrative provisions, and unanimity for changing the length of the said time limit.

*Paragraph (6)(b):* Abstentions, whether explicit or tacit, of delegations represented in the Assembly are, of course, counted in the quorum.

*Paragraph (7)(a):* Traditionally, the place and the period are Geneva and the end of September/beginning of October.

In some other treaties which are administered by WIPO and which constitute a Union, the Union has not only an Assembly but also an Executive Committee (generally consisting of one quarter of the States members of the Assembly) and that Committee meets once a year and the Assembly once every three years. For the purposes of the present Treaty, the constitution of a body (e.g., an Executive Committee) consisting of some only of the members of the Union is not proposed and it is proposed that the Assembly meet every year. The main reasons for not proposing the establishment of an Executive Committee and for proposing the institution of annual sessions of the Assembly are that the Regulations, including the fees under those Regulations would probably have to be under constant review, that relatively large sums of money would go to the member States through the Union each year, and that those are all matters of equal interest to all member States.

*Paragraph (7)(b):* The request will be addressed to the Director General, who must then convene the extraordinary session.

*Paragraph (8):* There are in existence what are called the General Rules of Procedure of WIPO, which the organs of the various Unions usually take as a basis for their own rules of procedure. The latter may, of course, differ from the former in any and every respect which the Assembly sees fit.

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## ARTICLE 102

*International Bureau*

(1) The International Bureau shall:

(i) perform the administrative tasks concerning the Union; in particular, it shall perform such tasks as are specially assigned to it under this Treaty or by the Assembly;

(ii) provide the secretariat of revision conferences, of the Assembly, of the committees and working groups established by the Assembly, and of any other meeting convened by the Director General and dealing with matters of concern to the Union.

(2) The Director General shall be the chief executive of the Union and shall represent the Union.

(3) The Director General shall convene any committee and working group established by the Assembly and all other meetings dealing with matters of concern to the Union.

(4)(a) The Director General and any staff member designated by him shall participate, without the right to vote, in all meetings of the Assembly, the committees and working groups established by the assembly, and any other meeting convened by the Director General and dealing with matters of concern to the Union.

(b) The Director General, or a staff member designated by him, shall be ex officio secretary of the Assembly, and of the committees, working groups and other meetings referred to in subparagraph (a).

(5)(a) The Director General shall, in accordance with the directions of the Assembly, make the preparations for revision conferences.

(b) The Director General may consult with intergovernmental and international non-governmental organizations concerning the said preparations.

(c) The Director General and persons designated by him shall take part, without the right to vote, in the discussions at revision conferences.

(d) The Director General, or a staff member designated by him, shall be ex officio secretary of any revision conference.

(6) The Regulations shall specify the services that national Offices shall render in order to assist the International Bureau in carrying out its tasks under this Treaty.

COMMENTS ON ARTICLE 102

*Paragraph (1)(i):* Among the tasks specially assigned, the most important are the receiving of the international applications, the keeping of the International Register of Marks, the publication of the Gazette, and the notification of national Offices and owners of international registrations.

*Paragraph (1)(ii):* As to revision conferences, see Article 106(2).

*Paragraph (2):* A similar provision is included in the "Charters" of all the Unions administered by WIPO.

*Paragraph (3):* The rules of procedure will contain provisions as to agendas and the length of the period which must be left between the sending of the preparatory documents and the meeting. In one case (Article 107(1)(b)), this period is fixed by the Treaty itself.

*Paragraph (4)(a):* "Participate" should be understood as meaning that he has the right to be present and the right to speak.

*Paragraph (4)(b):* The usual tasks of the Secretary are to assist the Chairman and prepare a draft report on the meeting.

*Paragraph (5)(a):* As to revision conferences, see Article 106(2). "Preparations" mainly consist in making proposals, receiving and distributing any proposals made by member States, convening preparatory meetings and preparing proposals for such meetings.

*Paragraph (5)(b):* This is a customary provision for all Unions administered by WIPO.

*Paragraph (5)(c):* "Take part" should be understood as meaning that they have the right to be present and the right to speak.

*Paragraph (5)(d):* See the comments made on paragraph (4)(b).

*Paragraph (6):* Such sources include, for example, furnishing their statistics. Naturally, the services in question would be of the same kind for each national Office.

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## ARTICLE 103

*Finances*

(1)(a) The Union shall have a budget.

(b) The budget of the Union shall include the income and expenses proper to the Union, its contribution to the budget of expenses common to the Unions, and any sum made available to the budget of the Conference of the Organization.

(c) Expenses not attributable exclusively to the Union but also to one or more other Unions administered by

the Organization shall be considered as expenses common to the Unions. The share of the Union in such common expenses shall be in proportion to the interest the Union has in them.

(2) The budget of the Union shall be established with due regard to the requirements of coordination with the budgets of the other Unions administered by the Organization.

(3) The budget of the Union shall be financed from the following sources:

(i) fees and other charges due for services rendered by the International Bureau in relation to the Union;
(ii) sale of, or royalties on, the publications of the International Bureau concerning the Union;
(iii) gifts, bequests, and subventions;
(iv) rents, interests, and other miscellaneous income.

(4)(a) The amounts of fees and charges due to the International Bureau and the prices of its publications shall be so fixed that they should, under normal circumstances, be sufficient to cover the expenses of the International Bureau connected with the administration of this Treaty.

(b) If the budget is not adopted before the beginning of a new financial period, it shall be at the same level as the budget of the previous year, as provided in the financial regulations. If the income exceeds the expenses, the difference shall be credited to a reserve fund.

(5)(a) The Union shall have a working capital fund which shall be constituted by a single payment made by each Contracting State. If the fund becomes insufficient, the Assembly shall arrange to increase it. If part of the fund is no longer needed, it shall be reimbursed.

(b) The amount of the initial payment of each Contracting State to the said fund or of its participation shall be proportionate to the number of international applications which, among the total number of such applications, it is estimated that its residents will file. The participations of all Contracting States in the fund may be revised from time to time by the Assembly to make them correspond to the number of international applications actually filed by the residents of the various countries since the date of the initial payments or the last such revision.

(c) The proportion and the terms of payment shall be fixed by the Assembly on the proposal of the Director General and after it has heard the advice of the Coordination Committee of the Organization.

(d) If loans from the reserve fund permit the constitution of a working capital fund that is sufficient, the Assembly may suspend the application of the provisions of subparagraphs (a), (b), and (c).

(e) Any reimbursement under subparagraph (a) shall be proportionate to the amounts paid by each Contracting State, taking into account the dates at which they were paid.

(f) Any decision under subparagraphs (a) to (d) shall require two-thirds of the votes cast.

(6)(a) In the headquarters agreement concluded with the State on the territory of which the Organization has its headquarters, it shall be provided that, whenever the working capital fund is insufficient, such State shall grant advances. The amount of those advances and the conditions on which they are granted shall be the subject of separate agreements, in each case, between such State and the Organization. As long as it remains under the obligation to grant advances, such State shall have an ex officio seat in the Assembly if it is not a Contracting State.

(b) The State referred to in subparagraph (a) and the Organization shall each have the right to denounce the obligation to grant advances, by written notification. Denunciation shall take effect three years after the end of the year in which it has been notified.

(7) The auditing of the accounts shall be effected by one or more of the Contracting States or by external auditors, as provided in the financial regulations. They shall be designated, with their agreement, by the Assembly.

COMMENTS ON ARTICLE 103

*Paragraph (1)(a):* This provision and most of the others in this Article are identical or almost identical with the "Finances" provisions in the "Charters" of the other Unions administered by WIPO.

*Paragraph (1)(b):* The main sources of income will be fees and the sale of publications. The main expenses will be for staff salaries and printing. The "sum made available to the budget of the Conference of the Organization" would mainly serve purposes of technical assistance to member States. Similar provisions exist in the "Charters" of the Paris and Berne Unions. Of course, it is for the Assembly to decide whether to make any contribution for the said purpose and, if so, how much.

*Paragraph (1)(c):* Typical common expenses are those connected with the buildings used by the International Bureau and the staff salaries of such "common services" as the Director General's Office, External Relations, Finances, and Personnel.

*Paragraph (2):* Such coordination is mainly necessary in connection with the "common expenses."

*Paragraph (3):* Fees and the sale of publications will represent the greatest part of the income.

*Paragraph (4)(a):* In other words, the Union should be self-supporting. Consequently, there is no provision for any regular contribution by member States. In other words, any State which becomes party to the Treaty assumes no financial obligations, except, perhaps, that of contributing to a working capital fund. The constitution of such a fund may not, in certain circumstances, take place at all (see paragraph (5)(d)), but, if it does, its amount will be decided by the Assembly (see paragraph (5)(c)). Any contribution will be rather in the nature of a loan since it must be reimbursed if no longer needed (see paragraph (5)(a), last sentence).

The existing Madrid Agreement provides for the yearly distribution, among the member States, of any "profit" of the International Bureau, that is, of any difference between income and expenditure when the former is larger than the latter. The main source of income being fees, such profit means that the fees are set at a higher level than is necessary to make the international registration service self-supporting. The intention of this provision, and, more generally, of the proposed system, is not to make a profit but to fix the fees at the lowest possible safe level to make the service self-supporting. Consequently, there should be no or only an insignificant profit. That is why the present Draft does not provide for distribution of profits, but if there are any, they will be paid into a reserve fund.

*Paragraph (4)(b):* The financial regulations will be adopted by the Assembly.

*Paragraph (5)(a)(b)(c)(d)(e) and (f):* See the comments made in connection with paragraph (4)(a).

*Paragraph (6):* The State in question is Switzerland.

*Paragraph (7):* The financial regulations will be established by the Assembly.

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ARTICLE 104

*Regulations*

(1)(a) The Regulations under this Treaty provide rules:

(i) concerning matters in respect of which this Treaty expressly refers to the Regulations or expressly provides that they are or shall be prescribed,
(ii) concerning any administrative requirements, matters or procedures,
(iii) concerning any details useful in the implementation of this Treaty.

(b) Furthermore, the Regulations provide for the establishment, under the control of the Assembly, of Administrative Instructions by the Director General.

(2) The Regulations as adopted at the same time as this Treaty are annexed to this Treaty.

(3)(a) The Assembly may amend the Regulations.

(b) Subject to the provisions of subparagraph (c), amendments shall require two-thirds of the votes cast.

(c) The amendment of any provision concerning any of the following matters shall require three-fourths of the votes cast:

(i) the amount of fees paid by applicants or owners of international registrations under this Treaty which are intended for the national Offices of the Contracting States,

(ii) the distribution among the national Offices, and the transfer to them, of the fees referred to in (i), above.

(4)(a) In the case of conflict between the provisions of this Treaty and those of the Regulations or the Administrative Instructions, the provisions of this Treaty shall prevail.

(b) In the case of conflict between the provisions of the Regulations and those of the Administrative Instructions, the provisions of the Regulations shall prevail.

COMMENTS ON ARTICLE 104

*Paragraph (1)(a):* This provision is intended to define the scope of the Regulations, that is, the matters which they are likely to provide for.

*Paragraph (1)(b):* See Rule 103 (Administrative Instructions). "Under the control of the Assembly" is implemented by Rule 103.2, which reads as follows: "The Assembly may invite the Director General to modify any provision of the Administrative Instructions, and the Director General shall proceed accordingly."

*Paragraph (2):* "Annexed to this Treaty" means that the Regulations will be adopted in and by the diplomatic conference which will adopt the Treaty and that the text of the Regulations will be part of the document opened for signature at the end of that conference.

*Paragraph (3)(a):* This is probably the most important right of the Assembly.

*Paragraph (3)(b):* Amendment of subparagraph (c) requires three-fourths of the votes cast.

*Paragraph (3)(c):* The two items in this provision are the only matters in the Treaty or the Regulations which have an effect on the size of the income that each Contracting State will derive from the Treaty.

*Paragraph (4)(a) and (b):* The hierarchy of the three instruments (Treaty, Regulations, Administrative Instructions) follows that of the three organs (Diplomatic Conference, Assembly, Director General) which adopt them.

## ARTICLE 105

*Search Service*

(1) The International Bureau shall maintain a Service whose task shall be to search for anticipations among marks registered under this Treaty, and, to the extent authorized by the Assembly, other marks as well.

(2) Searches shall be made on request and shall be subject to the payment of fees fixed in the Administrative Instructions. The Service shall be at the disposal of any Government, national Office, other legal entity, or natural person.

(3) The amounts of the fees referred to in paragraph (2) shall be so fixed that they should be sufficient to cover the expenses of the International Bureau connected with the Service.

COMMENTS ON ARTICLE 105

*Paragraph (1):* Such a search Service for marks registered under the Madrid Agreement exists today and has been in existence for decades.. "Anticipations" means identical and similar marks. "Other marks" means marks registered under the Madrid Agreement and marks registered in the national register of marks of any given State. Inclusion in the Service of other marks, however, requires a decision by the Assembly.

*Paragraph (2):* Search reports are confidential between the requesting party and the International Bureau. They have, of course, no legal effect whatsoever..

*Paragraph (3):* The fees must make the Service self-supporting since no sources of revenue other than the fees are provided for.

# CHAPTER III: REVISION AND AMENDMENT

## ARTICLE 106

*Revision of the Treaty*

(1) This Treaty may be revised from time to time by a special conference of the Contracting States.

(2) The convocation of any revision conference shall be decided by the Assembly.

(3) The provisions referred to in Article 107(1)(a) may be amended either by a revision conference or according to the provisions of Article 107.

COMMENTS ON ARTICLE 106

*Paragraph (1):* "Special conference" means a diplomatic conference, that is, a conference among Governments represented by delegations having full powers to vote and sign.

*Paragraph (2):* "Revision conference" means the same as "special conference," the term used in paragraph (1).

*Paragraph (3):* The provisions referred to in Article 107(1)(a) are certain administrative provisions and the length of the time limit fixed in Article 12(2).

## ARTICLE 107

*Amendment of Certain Provisions of the Treaty*

(1)(a) Proposals for the amendment of the length of the time limit fixed in Article 12(2), or for any amendment to Article 101(5) and (7), 102, 103 and 105, may be initiated by any Contracting State or by the Director General.

(b) Such proposals shall be communicated by the Director General to the Contracting States at least six months in advance of their consideration by the Assembly.

(2)(a) Amendments to the provisions referred to in paragraph (1) shall be adopted by the Assembly.

(b) Adoption shall require three-fourths of the votes cast, provided that adoption of any amendment of the length of the time limit fixed in Article 12(2) shall require that no Contracting State vote against the proposed amendment.

(3)(a) Any amendment to the provisions referred to in paragraph (1) shall enter into force one month after written notifications of acceptance, effected in accordance with their respective constitutional processes, have been received by the Director General from three-fourths of the Contracting States members of the Assembly at the time the Assembly adopted the amendment.

(b) Any amendment to the said Articles thus accepted shall bind all the Contracting States which were Contracting States at the time the amendment was adopted by the Assembly, provided that any amendment increasing the financial obligations of the said Contracting States shall bind only those which have notified their acceptance of such amendment.

(c) Any amendment which has been accepted and which has entered into force in accordance with the provisions of subparagraph (a) shall bind all States which become Contracting States after the date on which the amendment was adopted by the Assembly.

COMMENTS ON ARTICLE 107

*Paragraph (1)(a):* The time limit fixed in Article 12(2) concerns refusals and notices of possible refusals. As to its length, the Draft contains several alternatives. Since it is believed that changing circumstances may make it desirable to lengthen or shorten those time limits, it is proposed to provide for them an easier procedure than a revision conference. That is why they appear in this provision. This provision follows very closely the Patent Cooperation Treaty (PCT), according to which any time limit fixed in that Treaty may be modified by a unanimous decision of the Assembly (see PCT Article 47(2) and PCT Rule 81). Here, too, unanimity is required (paragraph (2)(b)). But whereas the PCT allows such modification of any time limit fixed therein, the proposed Treaty allows the same modification in respect of one only of the time limits fixed in that Treaty. All other time limits (Articles 14(1)(c)(d), 16(1)(2), 18(3)(a)) can be changed only through a revision conference and any such change would bind only those States which ratify or accept the revised text. In the case of the proposed Treaty, this seems to be indispensable for the very important time limit fixed in Article 18(3)(a), and does not seem to matter as far as those time limits are concerned which it is unlikely to become necessary to change (Articles 14(1)(c)(d) and 16(1)(2)).

Article 101(5) and (7) are the provisions on the quorum in the Assembly and the provision on the times when ordinary and extraordinary sessions of the Assembly meet. Whereas the Stockholm Acts of the Paris Convention (Article 17) and of the Madrid Agreement (Article 13) provide that a qualified majority of the Assembly may amend any provision of that Convention or that Agreement concerning the Assembly, the PCT (Article 61(1)(a)) allows the same procedure only in the case of those provisions concerning the Assembly which deal with the quorum, voting on matters relating to Chapter II (inapplicable here) and the Executive Committee (inapplicable here). The proposed Draft follows the PCT by allowing the said procedure not in the case of all, but only in the case of some, of the provisions concerning the Assembly, namely, as already stated, in the case of the quorum (as in the PCT) and the frequency of the meetings of the Assembly (a matter not relevant in the PCT, which provides for an Executive Committee). The proposed Draft does not follow the Stockholm Act of the Paris Convention because, there,

the role of the Assembly is quite different (it has no regulation-making power); and it does not follow the Stockholm Act of the Madrid Agreement because the expected membership of the proposed Treaty will probably be more like that of the PCT than that of the present Madrid Agreement.

Article 102 deals with the International Bureau. The Stockholm Acts of the Paris Convention (Article 17) and the Madrid Agreement (Article 13), as well as the PCT (Article 61(1)(a)), follow exactly the same pattern.

Article 103 deals with the finances of the Union. The Stockholm Acts of the Paris Convention (Article 17) and the Madrid Agreement (Article 13), as well as the PCT (Article 61(1)(a)), follow exactly the same pattern.

Article 105 deals with the search Service. "Initiated" means "made."

*Paragraph (1)(b):* This provision is intended to give sufficient time for reflection to the Governments of the Contracting States.

*Paragraph (2)(a):* As to the required majority, see the following subparagraph.

*Paragraph (2)(b):* Since the time limit fixed in Article 12(2) is one which national Offices have to respect, it appears to be wise to place it under a unanimity rule.

*Paragraph (3)(a):* As to States which become Contracting States later, see subparagraph (c).

*Paragraph (3)(b):* In other words, no Contracting State will be bound by an amendment increasing its financial obligations unless it agrees to be so bound. The only financial obligation provided in the Draft is the obligation to contribute to a working capital fund (see Article 103(5)).

*Paragraph (3)(c):* As to becoming a Contracting State, see Article 108.

## CHAPTER IV: FINAL PROVISIONS

### ARTICLE 108

*Becoming Party to the Treaty*

(1) Any State member of the International Union for the Protection of Industrial Property may become party to this Treaty by:

(i) signature followed by the deposit of an instrument of ratification, or
(ii) deposit of an instrument of accession.

(2) Instruments of ratification or accession shall be deposited with the Director General.

(3)(a) Any instrument of ratification or accession may be accompanied by a declaration to the effect that it shall be considered to have been deposited only when:

(i) another State, or
(ii) either one of two other States, or
(iii) both of two other States,

specified by name, shall have deposited instruments of ratification or accession. The instrument of ratification or accession of any State having made such a declaration shall be considered to have been deposited on the day on which the specified State, or one of the two specified States, or the second specified State, as the case may be, deposits its instrument of ratification or accession.

(b) Any declaration made under subparagraph (a) may be withdrawn at any time or, if it was made in respect of two States in accordance with subparagraph (a)(iii), may be limited to one of them. The instrument of ratification or accession of any State withdrawing its declaration shall be considered to have been deposited on the day on which the withdrawal is notified to the Director General, whereas the instrument of ratification or accession of any State limiting its declaration shall be considered to have been deposited on the day on which the remaining State deposits its instrument of ratification or accession. If the instrument of ratification or accession of the remaining State has already been deposited, the instrument of ratification or accession of the State limiting its declaration shall be considered to have been deposited on the day on which the limitation is notified to the Director General.

COMMENTS ON ARTICLE 108

*Paragraph (1):* The legal effect of ratification and accession is the same. The difference is merely a terminological one, "ratification" referring to acceptance by a signatory State, and "accession" referring to acceptance by a State which has not signed the Treaty.

*Paragraph (2):* Such instruments are usually signed by the Head of State.

*Paragraph (3)(a):* This provision enables any State to say, in effect, that it will become party only if State X, or State X or State Y, or States X and Y, also become party. The provision is not without precedent. Protocol No. 3 of the Universal Copyright Convention, concluded in 1952, is an example of such a precedent.

*Paragraph (3)(b):* This provision enables any State having said, in effect, that it will become party only if State X also becomes party, to change its mind, which it might well wish to do if, in the meantime, the membership of State X has ceased to be indispensable in the eyes of the State having made the declaration.

### ARTICLE 109

*Entry Into Force of the Treaty*

(1) This Treaty shall enter into force six months after five States have deposited their instruments of ratification or accession.

(2) Any State which is not among those referred to in paragraph (1) shall become bound by this Treaty three months after the date on which it has deposited its instrument of ratification or accession.

COMMENTS ON ARTICLES 109

*Paragraph (1):* It has been said in the past that any new Treaty on the international registration of marks should come into effect only if certain States not members of the Madrid Union accept it. It is believed that this desire is largely met by Article 108(3)(a). Declarations under that Article and the naming of the same State or States can hold up the entry into force of the Treaty until the said State or States accept it, even if the number of other States runs to dozens.

In other words, the paragraph under consideration, although it speaks of five States does not necessarily mean that when five States have deposited their instruments the Treaty will come into force. The number actually required depends on the influence of the declarations made under Article 108(3)(a): it may be anything between five and any other, possibly much higher number.

*Paragraph (2):* The time limit of three months is the usual one.

### ARTICLE 110

*Reservations to the Treaty*

No reservations to this Treaty are permitted

COMMENTS ON ARTICLE 110

*Sole paragraph:* It is now accepted practice of the law of treaties that, when a Treaty does not provide for any possibility of making reservations, it must expressly state the fact in order to avoid any misunderstanding.

### ARTICLE 111

*Denunciation of the Treaty*

(1) Any Contracting State may denounce this Treaty by notification addressed to the Director General.

(2) Denunciation shall take effect one year after the day on which the Director General has received the notification.

(3) The right of denouncing this Treaty provided for in paragraph (1) shall not be exercised by any Contracting State before the expiration of five years from the date on which it becomes bound by this Treaty.

(4)(a) The effects of this Treaty on any mark enjoying the benefits of this Treaty on the day preceding the day on which the denunciation by any Contracting State takes effect shall continue in that State until the expiration of the initial or renewal term which was running on that date.

(b) The same shall apply in Contracting States other than the denouncing State in respect of marks whose international registration is owned by a resident or national of the denouncing State.

(c) The owner of the international registration of a mark may, during the year referred to in paragraph (2),

apply for the registration of the same mark in the national register of marks of any designated State. Such national registration shall, provided the requirements of the national law are complied with, be granted in that State, and the rights of the said owner under such national registration shall be deemed to include all rights, particularly any priority right, existing by reason of the effects of the said international registration in the said State. The foregoing provision shall apply to the extent that the goods and/or services listed in the said application are the same as the goods and/or services referred to in the said international registration in respect of the said State.

COMMENTS ON ARTICLE 111

*Paragraph (1):* This provision is subject to one exception stated in paragraph (3).

*Paragraph (2):* This provision is subject to certain qualifications stated in paragraph (4).

*Paragraph (3):* This provision is intended to give a certain degree of stability to the membership of the Union.

*Paragraph (4)(a):* This provision is intended to allow a certain period of time for owners of international registrations to look for means of protection other than under the Treaty in the denouncing State.

*Paragraph (4)(b):* This provision is intended to allow a certain period of time for owners of international registrations who are residents or nationals of the denouncing State to look for means of protection other than under the Treaty in any Contracting State other than the denouncing State.

*Paragraph (4)(c):* This provision is intended to allow a "switchover" from the International Register of Marks to the national register. In certain respects it parallels the provisions of Article 19.

ARTICLE 112

*Signature and Languages of the Treaty*

(1) This Treaty shall be signed in a single original in the English and French languages, both texts being equally authentic.

(2) Official texts shall be established by the Director General, after consultation with the interested Governments, in the German, Japanese, Portuguese, Russian and Spanish languages, and such other languages as the Assembly may designate.

(3) This Treaty shall remain open for signature at Vienna until December 31, 1973.

COMMENTS ON ARTICLE 112

*Paragraph (1):* This provision follows the trend of treaties recently concluded under the aegis of the Paris Convention.

*Paragraph (2):* The comment made in respect of the preceding paragraph applies also to this paragraph.

*Paragraph (3):* This provision assumes that the Vienna Diplomatic Conference, now scheduled for May 7 to June 2, 1973, will take place as scheduled and will adopt the Treaty.

ARTICLE 113

*Depositary Functions*

(1) The original of this Treaty, when no longer open for signature, shall be deposited with the Director General.

(2) The Director General shall transmit two copies, certified by him, of this Treaty to the Governments of the States party to the Paris Convention and, on request, to the Government of any other State.

(3) The Director General shall register this Treaty with the Secretariat of the United Nations.

(4) The Director General shall transmit two copies, certified by him, of any amendment to this Treaty to the Governments of the Contracting States and, on request, to the Government of any other State.

COMMENTS ON ARTICLE 113

*Paragraph (1):* This provision follows the contemporary trend of treaties recently concluded under the aegis of the Paris Convention.

*Paragraph (2):* The comment made in respect of the preceding paragraph applies also to this paragraph.

*Paragraph (3):* Article 102 of the Charter of the United Nations provides for the mandatory registration of treaties with the Secretariat of the United Nations.

*Paragraph (4):* The comment made in respect of paragraph (1) applies also to this paragraph.

ARTICLE 114

*Notifications*

The Director General shall notify the Governments of the States party to the Paris Convention of:

(i) signatures under Article 112;

(ii) deposits of instruments of ratification or accession under Article 108(2) and of any declaration accompanying them under Article 108(3)(a) and any withdrawal or limitation of such declarations made under Article 108(3)(b);

(iii) the date of entry into force of this Treaty under Article 109(1) and any amendment under Article 107(3)(a);

(iv) denunciations received under Article 111.

COMMENTS ON ARTICLE 114

*Sole paragraph:* These notifications are indispensable to keep the interested States officially informed of the status of the Treaty.

IN WITNESS WHEREOF, the undersigned, being duly authorized thereto, have signed this Treaty.

DONE at Vienna, on June . . ., 1973.

# DRAFT REGULATIONS [TRT/11/2]

# UNDER THE TRADEMARK REGISTRATION TREATY

(prepared by the International Bureau)

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## RULE 1

*Abbreviated Expressions*

1.1 *"Treaty"*

In these Regulations, the word "Treaty" means the Trademark Registration Treaty.

1.2 *"Chapter" and "Article"*

In these Regulations, the words "Chapter" and "Article" refer to the specified Chapter or Article of the Treaty.

1.3 *"International Classification"*

In these Regulations, "International Classification" means the classification provided for in the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks.

## RULES CONCERNING CHAPTER I

## RULE 2

*Duly Appointed Representatives*

2.1 *Number of Duly Appointed Representatives*

(a) Where there are several applicants or joint owners of the international registration, they may appoint only one representative.

(b) Where several natural persons or legal entities have been indicated as representatives by the applicant or applicants, or by the owner or joint owners of the international registration, the natural person or legal entity first mentioned in the document in which they are indicated shall be regarded as the only duly appointed representative.

2.2 *Form of Appointment*

(a) A representative shall be regarded as a "duly appointed representative" if his appointment complies with the prescriptions of paragraphs (b), (d) and (e).

(b) The appointment of any representative shall require:

(i) that his name appear as that of a representative in the international application, in the request or in any other document addressed to the International Bureau, and that such document bear the signature of the applicant or the owner of the international registration, or

(ii) that a separate power of attorney (i.e., a document appointing the representative), signed by the applicant or the owner of the international registration, be filed with the International Bureau.

(c) The signature shall not require any legalization or authentication.

(d) Where there are several applicants or several joint owners of the international registration, the document containing or constituting the appointment shall be signed by all of them.

(e) Any document containing or constituting the appointment of a representative shall indicate his name and his address. Where the representative is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). Where the representative is a legal entity (for example, a partnership of trademark lawyers or agents), "name" shall mean the complete official name of the legal entity. The address of the representative shall be indicated in the same manner as that provided for in respect of the applicant in Rule 5.2(c).

(f) Where the appointment does not comply with the requirements referred to in paragraphs (b), (d) and (e), it shall be regarded as non-existent.

2.3 *Revocation, Lapse, or Renunciation of Appointment*

(a) The appointment of any representative may be revoked at any time by the natural person who or legal entity which has appointed that representative. The revocation shall be effective even if only one of the natural persons who or legal entities which have appointed the representative revokes the appointment.

(b) Revocation shall require a written document signed by the natural person or the legal entity referred to in the preceding paragraph. The signature shall not require any legalization or authentication.

(c) The appointment of a representative as provided in Rule 2.2 shall be regarded as the revocation of any earlier appointment of any other representative.

(d) Any representative may renounce his appointment through a notification signed by him and addressed to the International Bureau.

## RULE 3

### *The International Register of Marks*

3.1 *Keeping of the Register*

(a) The International Register of Marks shall contain, in respect of each mark registered therein:

(i) all the indications that the applicant or owner of the international registration must or may furnish and has, in fact, furnished and, where relevant, the date on which such indications were received by the International Bureau,

(ii) the amount of all fees received and the date on which they were received by the International Bureau,

(iii) the dates and numbers of all international registrations and recordings,

(iv) any other indication whose recording is provided for by the Treaty and these Regulations.

(b) The Administrative Instructions shall regulate the establishment of the International Register of Marks, and, subject to the Treaty and these Regulations, shall specify the form in which it shall be kept and the procedure which the International Bureau shall follow for inscribing entries and recordings therein and for preserving it from loss or other damage.

## RULE 4

### *Applicants; Owners of International Registrations*

4.1 *Several Applicants; Joint Owners of the International Registration*

(a) If there are several applicants, the right to file an international application shall be recognized only if all of them are residents or nationals of Contracting States.

(b) If there are joint owners of an international registration, the right to own such a registration shall be recognized only if all of them are residents or nationals of Contracting States.

4.2 *Certain Associations of Natural Persons or Legal Entities*

Where, under the national law of a Contracting State, a certain type of association of natural persons or legal entities may acquire rights and be the subject of obligations without constituting a legal entity, such association shall be regarded as a legal entity for the purposes of the Treaty and these Regulations.

4.3 *The Same Applicants for All Designated States*

(a) The applicant or applicants shall be the same for the purposes of all the designated States.

(b) Where the international application, as filed, does not indicate the same applicant or applicants for the purposes of all the designated States, that application shall be treated as if only the State first mentioned therein, and any other State for the purposes of which the same applicant or applicants are indicated as for the said first-mentioned State, had been designated.

## RULE 5

### *Mandatory Contents of the International Application*

5.1 *Indication that the International Application Is Filed Under the Treaty*

The indication referred to in Article 5(1)(a)(i) shall be worded as follows: "The undersigned requests that the mark herein reproduced be registered in the International Register of Marks established under the Trademark Registration Treaty."

5.2 *Indications Concerning the Applicant*

(a) The applicant's identity shall be indicated by his name. If the applicant is a natural person, his name shall be indicated by his family name and given name(s), the family name being indicated before the given name(s). If the applicant is a legal entity, its name shall be indicated by the full, official designation of the said entity.

(b) The applicant's residence and nationality shall be indicated by the name(s) of the State(s) of which he is a resident and of which he is a national.

(c) The applicant's address shall be indicated in such a way as to satisfy the customary requirements for prompt postal delivery at the indicated address and shall, in any case, consist of all the relevant administrative units up to, and including, the house number, if any. Where the national law of the designated State does not require the indication of the house number, failure to indicate such number shall have no effect in that State. Any telegraphic and teletype address and telephone number that the applicant may have should preferably be indicated. For each applicant, only one address shall be indicated; if several addresses are indicated, only the one first mentioned in the international application shall be considered. Any subsequent change in address shall be recorded on request, free of charge, by the International Bureau.

5.3 *Reproduction of the Mark; Colors, Transliteration and Translation*

(a) Where the mark contains only letters of the Latin alphabet, Arabic or Roman numerals, and punctuation signs usual in connection with the Latin alphabet, and the applicant does not wish to claim any special graphic feature, the mark may be reproduced, for example by typing the letters, numerals and signs, on the sheet itself on

which the international application appears. The use of small letters and capital letters shall be permitted, and shall be followed in the publications of the International Bureau.

(b) In cases other than that referred to above, the mark shall be reproduced on a sheet of paper of A4 size (29.7 cm x 21 cm), separate from the sheet on which the text of the international application appears, and shall be attached to the latter sheet. The reproduction of the mark itself on the separate sheet shall not occupy a space larger than 10 centimeters horizontally and 10 centimeters vertically. [*Alternative A*: The mark may be in one or various colors.] [*Alternative B*: If colors are claimed, the reproduction shall be in black and white and the colors shall be described in words and, where the nature of the mark permits, also by means of the signs of the Heraldic Convention, as specified in the Administrative Instructions.] In any case, the reproduction shall be of a quality admitting of direct reproduction by photography and printing processes.

(c) [*Alternative A*: Any reproduction presented in color shall be reproduced in color in the publications of the International Bureau only if the application contains an express statement to the effect that color is claimed.] [*Alternative B*: If the provisions of paragraph (b) concerning colors are not complied with, no account shall be taken by the International Bureau of the claiming of colors.]

(d) Any reproduction of a three-dimensional object whose shape constitutes or is part of the mark shall be accompanied by an indication to the effect that the mark is a three-dimensional mark.

(e) Marks which cannot, or whose picture cannot, be reproduced by the usual printing processes shall not be the subject of international applications.

(f) Where the mark consists of or contains matter in script other than Latin script or numbers expressed in forms other than Arabic or Roman, the international application shall also contain a transliteration of such matter in Latin script and Arabic numerals; the transliteration shall follow the English pronunciation if the international application is in English, and the French pronunciation if it is in French. If the International Bureau finds that such transliteration is missing and it is equipped to effect the said transliteration itself, it shall proceed accordingly.

(g) If the mark consists of or contains words which are part of the vocabulary of the language of or the language in general use in the country of residence or nationality of the applicant, and where such language is other than English or French, the international application shall contain a translation of such words in the language in which the international application is written. If the International Bureau finds that such translation is missing and it is equipped to effect the translation itself, it shall proceed accordingly.

*5.4 List of Goods and/or Services*

(a) The goods and/or services concerning which the international registration is applied for shall be expressed in precise terms, and as far as possible in those terms appearing in the alphabetical list of the International Classification. The said terms shall be grouped according to the classes of the International Classification. Each of the said groups shall be preceded by an indication of the number of the class and the various groups shall follow in the numerical order of the corresponding classes.

(b) If the International Bureau finds that the terms used by the applicant do not correspond to the conditions laid down in the first sentence of paragraph (a), it may call this fact to the attention of the applicant.

(c) If the International Bureau finds that the grouping of the goods and/or services does not correspond to the conditions laid down in the second and third sentences of paragraph (a), it shall itself proceed with such grouping.

*5.5 Identification of the Designated State or States*

(a) Identification of the Contracting State or States shall consist in writing its name, or their names, in the international application in a manner sufficiently clear for the purposes of identification.

(b) Any identification of States which are not Contracting States shall be treated as if such identification had not taken place.

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## RULE 6

*Optional Contents of the International Application*

*6.1 Naming of a Representative*

The international application may indicate a representative.

*6.2 Claiming of Priority*

(a) The declaration referred to in Article 5(1)(b) shall consist of a statement to the effect that the priority of an earlier application is claimed and shall indicate:

(i) where the earlier application is an application filed for the registration of the mark in the national register of marks of a country, the country in which it was filed; where the earlier application is an international application filed under the Treaty, the State or States designated therein; where the earlier application is an application for a regional mark, the authority with which it was filed and the State or States for which it was filed;

(ii) the date on which the earlier application was filed;

(iii) the number allotted to the earlier application.

(b) If the declaration does not indicate the country, State or States, and the date, referred to in paragraph (a)(i) and (ii), the International Bureau shall treat the declaration as if it had not been made.

(c) If the application number referred to in paragraph (a)(iii) is not indicated in the declaration but is furnished by the owner of the international registration to the International Bureau prior to the expiration of the 10th month from the filing date of the said application, it shall be considered by all States designated prior to the expiration of 6 months counted from the said date to have been furnished in time, and the number so furnished shall be published by the International Bureau.

(d) If the filing date of the earlier application as indicated in the declaration precedes the filing date of the international application by more than 6 months, the International Bureau shall treat the declaration as if it had not been made.

(e) If the statement referred to in Article 5(1)(b) claims the priority of more than one earlier application, the provisions of paragraphs (a) to (d) shall apply to each of them and the statement shall specify which of the earlier applications relate to which of the goods and/or services listed in the international application.

*6.3 Declaration of Intent To Use the Mark*

(a) Any declaration made under Article 18(4) shall consist of the following statement: "The undersigned applicant declares that (he) (it) intends to use the mark which is the subject of this international application himself (itself) and/or by and through persons authorized by him (it) in commerce with and/or on the territory of . . . [either insert "each of the States designated in this application" or indicate those of the States designated in respect of which the declaration is made] on and/or in

connection with the goods and/or services listed in this application." Blanks shall be filled in by the applicant, as appropriate.

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently from the statement in paragraph (a) shall produce the effect provided for in Article 18(4) in that State.

6.4 *Declarations Under Articles 19(2) and 20(2)*

(a) Any declaration made under Article 19(2) or Article 20(2) and relating to one or more States designated in the international application may:

(i) be included in the international application, or
(ii) be filed as a separate document after the filing of the said application.

(b) Where the declaration referred to in paragraph (a) is filed under Article 19(2), it shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the applicant owns national registrations of the same mark in the said State or States,
(iii) indicate, in respect of each such national registration, its number and the goods and/or services to which it relates,
(iv) if the said declaration is filed as a separate document, identify the international application by attaching a copy thereof or, where international registration has already been granted, by indicating the international registration number.

(c) Where the declaration referred to in paragraph (a) is filed under Article 20(2), it shall:

(i) specify the designated State or States in respect of which it is made,
(ii) contain the allegation that the applicant seeking the international registration of the mark under the Treaty owns an international registration of the same mark under the Madrid Agreement ("Madrid registration") in respect of the said State or States,
(iii) indicate the number of the Madrid registration and, in respect of each of the said States, the goods and/or services to which such registration applies,
(iv) if the said declaration is filed as a separate document, identify the international application by attaching a copy thereof or, where international registration has already been granted, by indicating the international registration number.

6.5 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register (for example, "Supplemental Register" or "Part B Register").

6.6 *Trade or Business of the Applicant*

The applicant may indicate in the international application the trade or business in which he is engaged.

6.7 *"Marque collective"*

(a) Where the mark which is the subject of the international application is presented as a *"marque collective,"* the international application shall contain the appropriate indication.

(b) The term *"marque collective"* includes certification marks.

[NOTE: If this Rule is maintained, Article 18 will have to be completed to permit designated States to require the filing of supporting documents.]

## RULE 7

*Language of International Applications, Requests for Recording of Later Designations, Registrations, Recordings, Notifications, and Correspondence*

7.1 *Language of the International Application*

The international application shall be in the English or in the French language.

7.2 *Language of the Request for Recording of Later Designations*

The request for the recording of any later designation shall be in the same language as that in which the international application was filed.

7.3 *Language of Registrations, Recordings, Notifications, Correspondence*

(a) Registrations, recordings and notifications by the International Bureau shall be in the same language as that in which the international application was filed.

(b) Correspondence between the International Bureau and the applicant or the owner of the international registration, or his duly appointed representative, shall be in the same language as that in which the international application was filed.

(c) Notifications by the national Offices to the International Bureau, and letters or other written communications from the national Offices to the International Bureau, shall be in the English or in the French language, it being understood that copies of papers filed by a third party in the case of an opposition procedure attached to any notice of possible refusal shall be in the original language of such papers.

(d) Where the International Bureau is under the obligation to forward to the applicant any of the communications referred to in paragraph (c), it shall forward them in the language in which it received them.

## RULE 8

*Form of the International Application*

8.1 *Printed Forms*

(a) The international application shall be made on a printed form furnished free of charge, on request, by the International Bureau to prospective applicants, attorneys, patent or trademark agents, and the national Offices.

(b) The form shall be filled in preferably by typewriter and shall be easily legible.

8.2 *Copies; Signature*

(a) The international application, including the reproduction of the mark and any attachments, shall be filed in one copy.

(b) The international application shall be signed by the applicant.

(c) Where the applicant is a legal entity, the name of the legal entity shall be indicated in the place reserved for signatures and shall be accompanied by the signature or signatures of the natural person (persons) who is (are), according to the national law of the country under whose law the legal entity was established, entitled to sign for such legal entity.

8.3 *No Additional Matter*

(a) The international application shall not contain any matter and shall not be accompanied by any document other than those prescribed or permitted by the Treaty and these Regulations.

(b) If the international application contains matter other than that prescribed or permitted, the International Bureau shall delete it ex officio; and if it is accompanied

by any document other than those prescribed or permitted, the International Bureau shall treat it as if it had not been transmitted to it.

## RULE 9

### *Fees Payable With the Filing of the International Application*

9.1[A] *Fees Payable in Any Case (Alternative A)*

(a) The fees payable with the international application shall be the following:

(i) a basic fee,
(ii) as many designation fees as there are designated States,
(iii) as many class fees as there are classes to which the goods and/or services listed in the international application belong according to the International Classification [*Sub-alternative*: multiplied by the number of designated States].

(b) The amount of each of the said fees is indicated in the Table of Fees.

9.1[B] *Fees Payable in Any Case (Alternative B)*

(a) The fees payable with the international application shall be the following:

(i) an international fee,
(ii) State fees for every designated State.

(b) The amount of the international fee is indicated in the Table of Fees.

(c) The amounts of the State fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the State fees from January 1 to December 31 of the year following the year in which they are published.

(d) Each Contracting State shall, subject to the following provisions, be free to determine the amount of the State fee applicable to it:

(i) Each Contracting State shall communicate the amount in Swiss francs of the State fee to the International Bureau each year before the end of the month of June. If the said communication is not made within the said time limit, the amount last communicated shall remain applicable.
(ii) The amount of the State fee may vary only according to the number of classes to which the goods and/or services listed in the international application belong according to the International Classification. For each class, the fee shall be the same.
(iii) The amount of the State fee shall not exceed the total amount of [*Sub-alternative*: 75% of] any filing, registration, publication or class fees which would be payable if the application were an application for registration in the national register of marks.

9.2 *Fees Payable in the Case of Certain Defects in the International Application (Both Alternatives)*

(a) If the International Bureau finds that the requirement of transliteration or translation contained in Rule 5.3(f) and (g) has not been complied with, or that the requirement of proper grouping of the goods and/or services contained in Rule 5.4(b) has not been complied with, it may charge the applicant a "transliteration fee," a "translation fee," or a "classification fee," as the case may be.

(b) If the indication of the applicant's trade or business exceeds twenty words, the International Bureau may charge the applicant a fee.

(c) The amounts of the fees referred to in paragraphs (a) and (b) are indicated in the Table of Fees.

9.3 *Exemption from Certain Fees*

Where the owner of the international registration of a mark registered under the Madrid Agreement for certain goods and/or services applies for the international registration of the same mark for the same goods and/or services under the Treaty at least five years before the expiration of the then current term of protection under the Madrid Agreement and files a declaration under Article 20(2), he shall be exempt from [*Alternative A:* the designation fee] [*Alternative B:* the State fee] in respect of any Contracting State in which his mark is then protected by virtue of the Madrid Agreement.

## RULE 10

### *Mandatory Contents of the Request For Recording of Later Designation*

10.1 *Indication that the Request Is for Recording of Later Designation*

The indication referred to in Article 6(2)(a)(i) shall be worded as follows: "The undersigned applicant/owner of the international registration requests the recording in the International Register of Marks of the following later designation made under the Trademark Registration Treaty."

10.2 *Indications Concerning the Applicant or the Owner of the International Registration*

The provisions of Rule 5.2 shall also apply, *mutatis mutandis*, in the case of Article 6(2)(a)(ii).

10.3 *Identification of the International Application or International Registration*

(a) The international application shall be identified by a copy of the same and the date on which it was filed with or mailed to the International Bureau.

(b) The international registration shall be identified by its international registration number and date.

10.4 *Identification of the Later Designated State*

The provisions of Rule 5.5 shall also apply, *mutatis mutandis*, in the case of Article 6(2)(a)(iv).

## RULE 11

### *Optional Contents of the Request for Recording of Later Designation*

11.1 *Claiming of Priority*

Rule 6.2 shall apply also to the declaration referred to in Article 6(2)(b), provided that any reference in Rule 6.2(c) and (d) to the filing date of the international application shall be construed as a reference to the filing date of the request for recording a later designation.

11.2 *Declaration of Intent To Use the Mark*

(a) Any declaration made under Article 18(4) shall consist of the following statement: "The undersigned applicant/owner of the international registration intends to use the mark which is the subject of the international application/international registration to which this request relates himself (itself) and/or through persons authorized by him (it) in commerce with and/or on the territory of the State designated herein on and/or in connection with the goods and/or services listed in this request."

(b) It shall depend on the national law of each designated State whether any declaration to the same effect as but worded differently from the statement in paragraph (a) shall produce the effect provided for in Article 18(4) in that State.

11.3 *Declaration Under Articles 19(2) and 20(2)*

(a) Any declaration made under Articles 19(2) and 20(2) and relating to one or more States which are the subject of a later designation shall be included in the request for recording such designation or be filed as a separate document after the filing of the said request.

(b) The declaration shall contain the indications provided for in Rule 6.4(b) or (c), as the case may be.

11.4 *List of Goods and/or Services*

Where the applicant or owner of the international registration wishes to indicate a list of goods and/or services more limited than the list which was included in the international application or which was published with the international registration, he shall set out, in his request, the more limited list, presented in a form which conforms with the concept of limitation as defined in Rule 22.2, or, if paragraph (c) of the said Rule is applicable, he shall set forth the more limited list in conformity with the decision of the national Office, or other competent authority of the later designated State, and shall attach to the request the indications concerning such decision specified in Rule 22.1(a)(v).

11.5 *Option Under Article 11(3)*

The indication referred to in Article 11(3) shall be effected by identifying the appropriate national register (for example, "Supplemental Register" or "Part B Register").

## RULE 12

*Form of the Request for Recording of Later Designation*

12.1 *Printed Forms*

(a) The request referred to in Article 6(2)(c) shall be made on a printed form furnished free of charge, on request, by the International Bureau to applicants, owners of international registrations, attorneys, patent or trademark agents, and the national Offices.

(b) The form shall be filled in preferably by typewriter and shall be easily legible.

12.2 *Copies; Signature*

(a) The request referred to in Article 6(2)(c) and any attachments thereto shall be filed in one copy.

(b) The request shall be signed by the applicant.

12.3 *No Additional Matter*

Rule 8.3 shall also apply to requests for recording later designations.

## RULE 13

*Fees Payable With the Request for Recording of Later Designation*

13.1 [A] *Later Designation Fees (Alternative A)*

(a) The fees referred to in Article 6(2)(c) shall, for each later designation, be the following:

(i) a basic later designation fee,
(ii) a designation fee [*Sub-alternative*: and as many class fees as there are classes to which the goods and/or services listed in respect of the designated State belong according to the International Classification].

(b) The amount of the fees referred to in paragraph (a)(i) is indicated in the Table of Fees. The amount of the fee referred to in paragraph (a)(ii) is the same as that of the fee referred to in Rule 9.1[A](a)(ii).

13.1[B] *Later Designation Fees (Alternative B)*

(a) The fees payable with the request for the later designation of any Contracting State shall be the following:

(i) an international later designation fee,
(ii) the State fee applicable to the designated State.

(b) The amount of the international later designation fee is indicated in the Table of Fees.

(c) The State fee shall be the same as that referred to in Rule 9.1[B](a)(ii).

13.2 *Exemption from Certain Fees (Both Alternatives)*

The provisions of Rule 9.3 shall, *mutatis mutandis*, also apply in connection with the fee [*Sub-alternative*: fees] referred to in Rule 13.1[A](a)(ii).

## RULE 14

*Defects in the International Application*

14.1 *Time Limit Under Article 7(2)*

The time limit under Article 7(2) shall be 1 month from the date of the registered letter from the International Bureau containing the invitation to sign the application or to pay the fees or the missing part of the fees.

14.2 *Minimum Amount Under Article 7(2)*

The minimum amount referred to in Article 7(2) shall be an amount equivalent at least to the total amount of [*Alternative A*: the basic fee, one designation fee and one class fee, referred to in Rule 9.1[A](a)] [*Alternative B*: the international fee and that State fee which, among the State fees of all the designated States, is the lowest].

14.3 *Calling Attention to Defects Other Than Those Referred to in Article 7(2)*

Where any international application has any defect other than those referred to in Article 7(2), the International Bureau may call it to the attention of the applicant.

14.4 *Notification, and Reimbursement of Certain Fees, Under Article 7(3)*

Where, under Article 7(3), the International Bureau declines the international application, it shall notify the applicant by registered letter stating the reasons for declining and shall reimburse to him those [*Alternative A*: designation fees and class fees referred to in Rule 9.1[A](a)(ii) and (iii)] [*Alternative B*: State fees referred to in Rule 9.1[B](a)(ii)] which he has paid.

[14.5 *Non-Compliance With Certain Provisions of Nation Laws*

The International Bureau shall not take note of any lack of compliance with possible provisions of national laws referred to in Article 5(3).]

## RULE 15

*Defects in the Request for Recording of Later Designation*

15.1 *Time Limit Under Article 8(2)*

The time limit under Article 8(2) shall be 1 month from the date of the registered letter from the International Bureau containing the invitation to conform with the concept of limitation, sign the request, or pay the fees or the missing part thereof.

15.2 *Minimum Amount Under Article 8(2)*

The minimum amount referred to in Article 8(2) shall be an amount equivalent at least to [*Alternative A*: the

basic later designation fee] [*Alternative B*: the international later designation fee].

15.3 *Calling Attention to Defects Other Than Those Referred to in Article 8(2)*

Where any request for the recording of a later designation has any defect other than those referred to in Article 8(2), the International Bureau may call it to the attention of the applicant or owner of the international registration.

15.4 *Notification, and Reimbursement of Certain Fees, Under Article 8(3)*

Where, under Article 8(3), the International Bureau declines the request for the recording of the later designation, it shall notify the applicant or owner of the international registration by registered letter stating the reasons for declining and shall reimburse to him [*Alternative A*: the designation fee referred to in Rule 13.1[A](a)(ii)] [*Alternative B*: the State fee referred to in Rule 13.1[B](a)(ii)] to the extent to which he has paid it.

[15.5 *Non-Compliance With Certain Provisions of National Laws*

The International Bureau shall not take note of any lack of compliance with possible provisions of national laws referred to in Article 6(3).]

## RULE 16

*Procedure Where Avoiding the Effect of Declining Is Sought*

16.1 *Time Limit Under Article 9(1)*

The time limit referred to in Article 9(1) shall be 3 months from the date of the notification referred to under Rule 14.4, or Rule 15.4, as the case may be.

16.2 *Recording and Publication Under Article 9(1)*

(a) The fact of having received a copy of a petition under Article 9(1) shall be recorded by recording the subject of the petition, the name of the national Office to which it appears to be addressed, and the date on which the said copy was received.

(b) The information to be published under Article 9(1) shall indicate the international registration number of the mark, the name of the State to whose national Office the petition appears to have been addressed, and the date on which the copy of the petition was received by the International Bureau.

16.3 *Notification of National Offices Under Article 9(1)*

On the request of the applicant, the International Bureau shall send to each interested national Office a copy of the file of the declined international application or declined request for recording of later designation, together with a memorandum setting out the reasons for and the various steps leading to the declining of the said application or request.

## RULE 17

*Publication of International Registrations and Recordings of Later Designations*

17.1 *Contents of Publication of International Registrations*

(a) The publication of any international registration shall contain:

(i) the name and address of the applicant together with any indication of his trade or business and, if he bases his right to file international applications on his residence in, or his nationality of, a State other than that in which he has his address, the name of the State of his residence or nationality, as the case may be,
(ii) the reproduction of the mark, together with any transliteration, translation, [or description of color or colors,]
(iii) the list of goods and/or services,
(iv) the names of the designated States,
(v) the international registration date,
(vi) the international registration number,
(vii) where the priority of one or more earlier applications is claimed, the date of filing and the number (if available) of such applications, and the name of the country or countries in which or for which they were filed,
(viii) where appropriate, an indication that the mark is a *marque collective*,
(ix) any indication under Article 11(3),
(x) any declaration under Articles 19(2) and 20(2).

(b) The international registration number shall be a single serial number, followed by an oblique stroke and a zero.

17.2 *Contents of Publication of Recordings of Later Designations*

(a) The publication of any recording of a later designation shall contain:

(i) the international later designation number,
(ii) the date of the recording of the later designation,
(iii) the name of the later designated State,
(iv) if, for the purposes of the later designated State, the list of goods and/or services is more limited than the list of goods and/or services which was published with the international registration, the more limited list,
(v) any indication under Article 11(3),
(vi) any declaration under Articles 19(2) and 20(2).

(b) The international later designation number shall consist of the international registration number of the international registration to which the later designation refers, followed by an oblique stroke and a number indicating the original number of the later designation in question among all the later designations referring to the same international registration.

(c) Where the recording of the later designation was effected sufficiently prior to the date of publication of the international registration to be practical to do so, the said publication shall, itself, contain the elements indicated in paragraph (a)(ii), (iii), (iv), (v) and (vi), and the number of the said publication shall consist of the number referred to in Rule 17.1(b) and the number or numbers referred to in paragraph (b).

## RULE 18

*Notification of International Registrations and Recordings of Later Designations*

18.1 *Form of Notifications*

The notification referred to in Article 10(2) shall be effected separately for each national Office and shall consist of:

(i) a list of the international registration numbers and the international later designation numbers of the international registrations and recordings of later designations in which the State of the said Office has been designated,
(ii) separate reprints made of the publication by the International Bureau of each international registration referred to in the said list,

(iii) a copy of the international application or the request for the recording of later designation if it contains a declaration of intent to use made under Article 18(4).

18.2 *Frequency of Notifications*

The notification shall be effected on the same day as that on which the issue of the Gazette is published which contains the matter from which the reprints referred to in Rule 18.1 are made.

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RULE 19

*Refusals; Notices of Possible Refusal*

19.1 *Notifying the International Bureau; Reasons*

(a) Any notification under Article 12(2) shall be sent in one copy, preferably on a form furnished free of charge by the International Bureau to the national Office of each Contracting State. The notification shall, in any case, contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the refusal or the notice of possible refusal relates,
(ii) the name of the owner of the said international registration,
(iii) an indication as to whether the notification is that of a refusal or of a notice of possible refusal,
(iv) if it relates to some only of the goods and/or services listed, identification of those to which it relates,
(v) the reasons referred to in Article 12(2)(a)(ii) and (iii), together with a reproduction of any mark cited in the notification and not reproduced therein, and, when the notice of possible refusal specifies the reasons by reference to the opposition of a third party, a copy of any document filed by the opposing party in which the said reasons are specified,
(vi) an indication as to whether any remedy is available, and if so with which authority it has to be sought and within what time limit.

(b) The form referred to in paragraph (a) shall be prepared separately for each Contracting State, in collaboration with its national Office. It shall list the more common of the reasons for refusal with a reference to the pertinent provisions of the national law so that, wherever possible, such reasons may be specified by marking the applicable items of the list. The form shall contain a space reserved for specifying any other reasons and for other possible indications.

19.2 *Notifying the Owner of the International Registration*

(a) The notification referred to in Article 12(3)(a) shall indicate the date on which any notification made under Article 12(2) was received by the International Bureau and shall include a copy thereof.

(b) The International Bureau shall effect any notification referred to in Article 12(3)(a) promptly after the receipt of the notification referred to in Article 12(2).

19.3 *Notification and Recording of Final Decisions of Refusal; Cancellation of the Designation, and Publication of the Cancellation*

(a) The notification to be effected by the national Office under Article 12(4)(a) shall be effected promptly after the date on which the decision of refusal becomes final. The notification shall contain:

(i) the indications referred to in Rule 19.1(a)(i) and (ii);
(ii) the reasons given in the decision;
(iii) if the notification relates to some only of the goods and/or services listed, identification of those to which it relates;
(iv) the name of the authority which pronounced the decision, the number, if any, and the date of such decision, and
(v) the date on which the decision became final.

(b) The notification to be effected by the International Bureau under Article 12(4)(a) shall be effected as soon as possible and shall include a copy of the notification referred to in paragraph (a).

(c) The details of the recording referred to in Article 12(4)(a) shall be provided in the Administrative Instructions.

(d) The publication referred to in Article 12(4)(a) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision of refusal.

19.4 *Notification Where Final Decision Results in Acceptance of the Effect Provided for in Article 11(2)*

The notification under Article 12(4)(b) shall be effected promptly after the final disposal of the case and shall consist of a statement to the effect that the notice of possible refusal or the refusal is withdrawn, the indications referred to in Rule 19.1(a)(i) and (ii), the number, if any, and the date of the decision, and the date on which the decision became final.

19.5 *Belated Notifications*

If any notification referred to in Article 12(2) is received by the International Bureau after the expiration of the time limit fixed in that provision, the International Bureau shall inform accordingly the national Office which effected the notification and shall treat such notification as if it had not been effected.

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RULE 20

*Final Decisions of Cancellation*

20.1 *Notification and Recording of Final Decisions of Cancellation; Cancellation of the Designation, and Publication of the Cancellation*

(a) The notification referred to in Article 13(2) shall be effected promptly after the date on which the decision of cancellation becomes final. The notification shall contain:

(i) the international registration number of the international registration, or the international later designation number of the later designation, as the case may be, to which the final decision of cancellation relates,
(ii) the name of the owner of the said international registration,
(iii) if the final decision relates to some only of the goods and/or services listed, identification of those to which it relates,
(iv) the name of the authority which pronounced the final decision,
(v) the number, if any, and the date of such decision,
(vi) the date on which the decision became final.

(b) The details of the recording referred to in Article 13(2) shall be provided in the Administrative Instructions.

(c) The publication referred to in Article 13(2) shall be effected promptly and shall consist of the indications contained in the notification referred to in paragraph (a), as well as the name of the State whose authorities have pronounced the final decision of cancellation.

## RULE 21

### *Recording of Changes in Ownership*

21.1 *Request for Recording of Change in Ownership*

(a) The request for recording referred to in Article 14(1)(a) shall indicate its purpose and contain:

(i) the name of the owner of the international registration,
(ii) the name, residence, nationality, and address, of the new owner, in the manner provided for indications to be furnished in respect of applicants,
(iii) the international registration number,
(iv) if the change in ownership relates to some only of the designated States, identification of those States to which it relates,
(v) if the change in ownership relates to some only of the goods and/or services listed in the international registration, a list of those of such goods and/or services to which it relates.

(b) The request shall be signed by the natural person or legal entity whose name appears in the International Register of Marks as the owner of the international registration or, if that person is dead or incapacitated, or—in the case of a legal entity—if it is dissolved or incapacitated, by his (its) successor in title or a person entitled to act for him or his estate. When the request is signed by the said successor in title or other person, it shall indicate his address and contain a statement of the reasons for which the owner of the international registration cannot sign it and for which the person signing is entitled to do so.

(c) The amount of the fee referred to in Article 14(3) is indicated in the Table of Fees.

21.2 *Procedure Where New Owner Is Entitled To File International Applications*

(a) Where the new owner is a natural person or legal entity entitled to file international applications and the request complies with the prescribed requirements, the International Bureau shall record the change in the ownership of the international registration as a whole or in respect of the designated States or goods and/or services specified in the request, as the case may be. If the request does not comply with the prescribed requirements, the International Bureau shall reject it and shall notify the owner of the international registration accordingly.

(b) The publication and the notifications referred to in Article 14(3) shall contain the indications referred to in Rule 21.1(a) and the date of the recording. All notifications shall bear the same date and shall be transmitted on the same day. Where the request referred to in Article 14(1)(a) was signed by a person other than the person whose name appears in the International Register of Marks as the owner of the international registration, this fact as well as the name of that other person, together with an indication of the capacity in which he signed, shall also be indicated in the said publication and notifications.

21.3 *Procedure Where New Owner Is Not Entitled To File International Applications*

(a) Where the new owner is a person (natural person or legal entity) not entitled to file international applications, the International Bureau shall not proceed to effect the requested recording but shall merely record the fact that, for the reason stated, the International Register of Marks is, subject to the last part of Article 14(1)(c), closed in respect of the international registration in question, or in respect of the designated States or goods and/or services specified in the request, as the case may be.

(b) The recording of the fact referred to in paragraph (a) shall be published by the International Bureau. Further details of the procedure are provided in the Administrative Instructions.

21.4 *Notification of Refusal; Recording and Publication*

The notification, recording and publication provided for in Article 14(4)(b) shall refer to the fact of the refusal, identify the State whose authorities pronounced the refusal, and contain:

(i) the name of the owner of the international registration,
(ii) the name of the purported new owner,
(iii) the international registration number,
(iv) a brief indication of the reasons for the refusal,
(v) the identification of the publication referred to in Article 14(3) which is the subject of the refusal.

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## RULE 22

### *Recording of Limitations of the List of Goods and/or Services*

22.1 *Request for Recording of Limitation of the List*

(a) The request for recording referred to in Article 15(1) shall indicate its purpose and contain:

(i) the name of the owner of the international registration,
(ii) the international registration number,
(iii) the desired limitation of the list of goods and/or services,
(iv) if the request relates to some only of the designated States, identification of those States to which it relates,
(v) if the request relates to one only of the designated States and conforms with a decision of the national Office or other competent authority of such State concerning the international registration, a certified copy of such decision and, if the decision is in a language other than English or French, a certified translation of such decision.

(b) The request shall be signed by the owner of the international registration.

(c) The amount of the fee referred to in Article 15(2) is indicated in the Table of Fees.

22.2 *Concept of Limitation*

(a) Subject to paragraph (c), any request under Article 15 shall be regarded as conforming with the concept of limitation if it is presented in either of the following forms:

(i) it asks for the deletion of one or more terms in the list of goods and/or services,
(ii) it asks for the insertion of one or more words, linked to the existing term by words (such as "except") which, from the point of view of syntax, make it clear that the inserted word or words are meant to be excluded from the existing term (for example, *milk products* (existing term) *except* (linking word) *condensed milk* (inserted words)),
(iii) it asks for the insertion of one or more words linked to the existing term by words (such as "provided that") from the point of view of syntax, make it clear that the inserted words are covered by the existing term (for example, *shoes* (inserted word) *provided that they are* (linking words) *rubber articles* (existing term)).

(b) Unless the limitation is presented in one of the forms described in paragraph (a), it shall not, subject to paragraph (c), be regarded as conforming with the concept of limitation, however clear it may be that, in the ordinary sense of the word, there is a limitation (for example, replacing the term "milk product" by "cheese").

(c) Paragraphs (a) and (b) shall not apply in the case contemplated under Rule 22.1(a)(v).

22.3 *Recording, Publication, and Notification, of Limitation of the List*

(a) If the request complies with the prescribed requirements, the International Bureau shall record the indications referred to in Rule 22.1(a) and the date on which the request was received. If the request does not comply with the prescribed requirements, the International Bureau shall decline the recording of the limitation and shall notify the owner of the international registration accordingly.

(b) The publication and the notification referred to in Article 15(2) shall contain the indications referred to in Rule 22.1(a) and the date of the recording.

22.4 *Declining the Recording of Limitation of the List*

The notification referred to in Article 15(3)(a) shall include the reasons for declining the recording of the limitation of the list of goods and/or services.

22.5 *Time Limit Under Article 15(3)(b)*

The time limit referred to in Article 15(3)(b) shall be 3 months from the date of the notification referred to in Article 15(3)(a).

22.6 *Non-Admission by Designated State*

(a) The notification referred to in Article 15(4) shall consist in indicating the recording to which it refers and the fact and date of the finding.

(b) The annotation and publication referred to in Article 15(4) shall contain the indications mentioned in paragraph (a).

(c) The details of the procedure concerning paragraphs (a) and (b) shall be provided in the Administrative Instructions.

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RULE 23

*Renewal*

23.1 *Reminder by the International Bureau*

The International Bureau shall send a letter to the owner of the international registration before the expiration of the term, initial or renewal (as the case may be), which is in effect, reminding him that such term is about to expire. Further details concerning the contents of the reminder shall be provided in the Administrative Instructions. The reminder shall be sent from 6 to 3 months prior to the expiration date. Failure to send or receive the reminder, or the fact of sending or receiving it outside the said period, shall not affect the expiration date.

23.2 *Demand for Renewal*

(a) The demand for renewal referred to in Article 16(3) shall preferably be made on a printed form furnished free of charge by the International Bureau together with the reminder referred to in Rule 23.1. The demand shall, in any case, indicate its purpose and contain:

(i) the name of the owner of the international registration, his residence and nationality, and his address,
(ii) the international registration number,
(iii) if the demand relates to some only of the designated States for the purposes of which the person presenting the demand is the owner of the international registration, the identification of those States to which the demand relates.

(b) The demand shall be signed by the owner of the international registration.

(c) The demand for renewal shall not be combined with any other request; in particular, it shall not contain a request for recording a later designation, a request for recording a change in ownership, or a request for recording a limitation in the list of goods and/or services. Rule 8.3 shall also apply to demands for renewal.

23.3[A] *Renewal Fees (Alternative A)*

The fees payable under Article 16(3) shall be the same as those referred to in Rule 9.1[A].

23.3[B] *Renewal Fees (Alternative B)*

(a) The fees payable under Article 16(3) shall be the following:

(i) an international renewal fee,
(ii) State renewal fees for every designated State.

(b) The amount of the international renewal fee is indicated in the Table of Fees.

(c) The amounts of the State renewal fees concerning the various Contracting States shall be published by the International Bureau each year in the month of August. The amounts so published shall be applicable as the State renewal fees from January 1 to December 31 of the year following the year in which they are published.

(d) Each Contracting State shall be free to determine the amount of the State renewal fee applicable to it, subject to the provisions of Rule 9.1[B](d)(i) and (ii) and provided that the amount of the said fee shall not exceed the amount of [*Sub-alternative:* 75% of] the renewal fee which would be payable if the demand were for the renewal in the national register of marks of the said State for a comparable period of time.

23.4 *Time Limits, Surcharge (Both Alternatives)*

(a) Subject to paragraph (b), both the demand and the fees referred to in Article 16(3) must reach the International Bureau by the last day of the term about to expire.

(b) Where, by the said day, the International Bureau has received the demand as prescribed and no renewal fees or an amount intended as renewal fees but which is less than the full amount payable for the demand, the International Bureau shall promptly invite the owner of the international registration to pay the fees or the missing part of the fees. If the said owner complies with the invitation within 6 months from the last day of the term about to expire, the fees or the missing part thereof shall be considered to have been paid within the time limit fixed in paragraph (a), provided that, where the payment reaches the International Bureau after the last day of the term, a surcharge whose amount is fixed in the Table of Fees shall also be payable within the said 6 months time limit.

(c) Failure to send or receive the invitation referred to in paragraph (b), or any delay in dispatching or receiving such invitation, shall not prolong the time limits fixed in that paragraph and in paragraph (a).

23.5 *Recording, Publication, and Notification*

Where the demand is presented and the fees are paid as prescribed, the International Bureau shall record the renewal, shall publish the indications referred to in Rule 23.2(a) together with a reference to all previous publications concerning the registration effected since the most recent renewal and an indication of the date on which the renewal shall expire, and shall notify the designated States of the said indications and the said date.

23.6 *Declining the Demand*

Where no demand is presented or the demand does not conform with the requirements of Rule 23.2 or the fees (including, where applicable, the surcharge referred to in Rule 23.4(b)) are not paid as prescribed, the International Bureau shall decline the demand and shall notify

the owner of the international registration by registered letter stating the reasons for declining the demand.

23.7 *Reimbursement of Certain Fees*

Where, under Rule 23.6, the International Bureau declines the demand, it shall reimburse to the owner of the international registration [*Alternative A:* the designation fee and the class fees referred to in Rules 23.3[A] and 9.1[A](a)(ii) and (iii)] [*Alternative B:* The State renewal fees referred to in Rule 23.3[B](a)(ii)] to the extent to which he has paid them.

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## RULE 23*bis*

### *Declarations of Actual Use*

23*bis*.1 *Information Concerning Requirements Under Article 18(3)(c), First Sentence*

The national Office of any Contracting State whose national law requires the filing of declarations within the meaning of the first sentence of Article 18(3)(c) shall inform the International Bureau of such requirement and of any changes therein. Such information shall, in particular, indicate the time limits within which such declarations must be filed according to the national law. The International Bureau shall promptly publish such information.

23*bis*.2 *National Forms*

The national Office of any Contracting State referred to in Rule 23*bis*.1 shall supply free of charge to the International Bureau in reasonable quantities declaration forms, in the form prescribed by the national law of that State, for the purposes of making declarations referred to in Article 18(3)(c). The International Bureau shall furnish such forms free of charge to interested persons.

[23*bis*.3 *International Forms*

(a) Where the declaration referred to in Article 18(3)(c) is not made on a national form according to Rule 23*bis*.2, it shall consist of the following statement and shall be signed by the owner of the international registration:

"The undersigned owner of the international registration declares that he (it) is the owner of the international registration which was effected under No. . . . , as shown by recordings in the International Register of Marks, in respect of . . . ① on . . . ②; that the mark which is the subject of the international registration herein identified is now in use by and through . . . ③ in commerce with and/or on the territory of the said State on or in connection with the following goods and/or services listed in respect of such State: . . . ④; that such use commenced on . . . ⑤; and that the mode or manner in which the mark is used is:

- ☐ on labels or tags affixed to and/or containers for the goods, as evidenced by the attached specimen(s) or facsimile(s);
- ☐ on displays which are associated with the goods, as evidenced by the attached specimen(s) or facsimile(s);
- ☐ in the case of services, in advertising of such services, as evidenced by the attached specimen(s) or facsimile(s);
- ☐ other [recite sufficient facts in addition to, or in lieu of, checking one or more of the above boxes as to sales or advertising, or both, to show that the mark is in current use].

"[① Insert name of State; ② insert international registration date or, if applicable, recording date of the later designation of such State; ③ Insert "the undersigned owner" and/or, if applicable, the name and address of the person and/or persons using the mark under the authority of the owner in the State; ④ Insert "all" or indicate the particular goods and/or services on or in connection with which the mark is used; ⑤ Insert the date of commencement of the continuing use of the mark, including, where different dates are applicable to different goods and/or services, the particular goods and/or services to which each such date relates.]"

Blanks shall be filled in by the owner of the international registration, as appropriate.

(b) The International Bureau shall furnish such forms free of charge to interested persons.

(c) The declaration shall be filed in the same language as the international application to which it relates.

(d) The specimens referred to in paragraph (a) shall, in the case of a mark for goods, be duplicates of the actually used labels, tags, or containers, or of the displays associated therewith, or portions thereof, when made of suitable material and capable of being arranged flat and of a size not larger than the declaration. When, owing to the mode of applying or affixing the mark to the goods or to the manner of its use on the goods, such specimens cannot be furnished, suitable photographs or other acceptable reproductions, not larger than the declaration, which clearly and legibly show the mark and all matter used in connection therewith shall be furnished. In the case of marks for services, specimens or facsimiles, as specified above, of the mark as used in the sale or advertising of the services shall be furnished unless impossible because of the nature of the mark or the manner in which it is used, in which event some other acceptable reproductions shall be furnished.

(e) It shall depend on the national law of each Contracting State whether any declaration to the same effect as but worded differently from the statement set out in paragraph (a) shall produce the same effect.]

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## RULE 24

### *Transmittal of Documents to the International Bureau*

24.1 *Place and Mode of Transmittal*

International applications, requests, demands, notifications and any other documents intended for filing, notification or other communication to the International Bureau shall be deposited with the competent service of that Bureau during the office hours fixed in the Administrative Instructions, or mailed to that Bureau, or deposited with or mailed to agencies of the said Bureau in places other than Geneva (Switzerland). The Administrative Instructions shall provide for the setting up and operation of any such agency.

24.2 *Date of Receipt of Documents Mailed*

Any document received by the International Bureau or any of its agencies through deposit or mail shall be considered to have been received on the day on which it is actually received by such Bureau or agency, provided that, when it is actually received after office hours, or on a day when the Bureau or the agency is closed for business, it shall be considered to have been received on the next subsequent day on which the Bureau or agency is open for business.

## RULE 25

### *Calendar; Computation of Time Limits*

25.1 *Calendar*

The International Bureau, national Offices, applicants and owners of international registrations shall, for the purposes of the Treaty and these Regulations, express any date in terms of the Christian era and the Gregorian calendar.

25.2 *Periods Expressed in Years, Months, or Days*

(a) When a period is expressed as one year or a certain number of years, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent year in the month having the same name and on the day having the same number as the month and the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(b) When a period is expressed as one month or a certain number of months, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire in the relevant subsequent month on the day which has the same number as the day on which the said event occurred, provided that if the relevant subsequent month has no day with the same number the period shall expire on the last day of that month.

(c) When a period is expressed as a certain number of days, computation shall start on the day following the day on which the relevant event occurred, and the period shall expire on the day on which the last day of the count has been reached.

25.3 *Local Dates*

(a) The date which is taken into consideration as the starting date of the computation of any period shall be the date which prevails in the locality at the time when the relevant event occurred.

(b) The date on which any period expires shall be the date which prevails in the locality in which the required document must be filed or the required fee must be paid.

25.4 *Expiration on a Non-Working Day*

If the expiration of any period during which any document or fee must reach the International Bureau or any of its agencies falls on a day on which such Bureau or agency is not open for business, or on which ordinary mail is not delivered in Geneva or the locality in which the agency is situated, the period shall expire on the next subsequent day on which neither of the said two circumstances exists.

## RULE 26

### *Payment of Fees*

26.1 *Payment to the International Bureau*

All fees payable under the Treaty and these Regulations shall be payable to the International Bureau.

26.2 *Currency*

(a) Subject to paragraph (b), all fees payable under the Treaty and these Regulations shall be payable in Swiss currency.

(b) Where the International Bureau has local agencies, referred to in Rule 24.1, the Administrative Instructions may, under specified conditions, allow exceptions to the provisions of paragraph (a).

26.3 *Deposit Accounts*

(a) Any natural person or legal entity may open a deposit account with the International Bureau or any of its agencies.

(b) The details concerning deposit accounts shall be provided in the Administrative Instructions.

26.4 *Indication of the Mode of Payment*

(a) Unless the payment is made in cash to the cashier of the International Bureau, the international application, and any request, demand, or other document, filed with the International Bureau in connection with any international registration, subject to the payment of any fee, shall indicate:

(i) the name and address, as provided in Rule 5.2(a), of the natural person or legal entity making the payment,

(ii) the mode of payment, which may be by an authorization to debit the amount of the fee to the deposit account of such person or entity, or by transfer to a bank account or to the postal cheque account of the International Bureau, or by cheque. The Administrative Instructions shall provide the details, in particular those governing the kind of cheques that shall be accepted in payment.

(b) Where the payment is made pursuant to an authorization to debit the amount of the fee to a deposit account, the authorization shall specify the transaction to which it relates, unless there is a general authorization to debit to a specified deposit account any fee concerning a certain applicant, owner of an international registration, or duly appointed representative. The details shall be provided in the Administrative Instructions.

(c) Where the payment is made by transfer to a bank account or to the postal cheque account of the International Bureau, or by a cheque not attached to the international application, request, demand, or other document, the notification of the transfer or the cheque (or paper accompanying it) shall identify the transaction to which it relates, in the manner to be provided for in the Administrative Instructions.

## RULE 27

### *Withdrawals and Renunciations*

27.1 *Withdrawal of the International Application or Request for Recording of Later Designation*

(a) Any withdrawal of an international application shall be treated as such by the International Bureau if the communication of withdrawal reaches it before registration is effected and preparations for publication have been completed.

(b) Any withdrawal of a request for the recording of later designation shall be treated as such by the International Bureau if the communication of withdrawal reaches it before recording is effected and preparations for publication have been completed.

27.2 *Renunciation of the International Registration or of Certain Designations*

(a) The owner of the international registration may, at any time, renounce the international registration or the recording of the designation of any designated State.

(b) Renunciation of the recording of all designated States shall be treated as renunciation of the international registration.

27.3 *Procedure*

(a) Withdrawals and renunciations referred to in Rules 27.1 and 27.2 shall be effected in a written communica-

tion addressed to the International Bureau and signed by the applicant or the owner of the international registration, as the case may be.

(b) The International Bureau shall acknowledge receipt of the communication referred to in paragraph (a). In the case of withdrawals, the International Bureau shall reimburse to the applicant [*Alternative A*: the fees referred to in Rule 9.1[A](a)(ii) and (iii), or Rule 13.1 [A](a)(ii), as the case may be] [*Alternative B*: the fees referred to in Rule 9.1 [B](a)(ii), or Rule 13.1[B](a)(ii), as the case may be].

(c) The International Bureau shall record and publish renunciations, and shall notify interested designated Offices thereof. The details shall be provided in the Administrative Instructions.

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## RULE 28

### *Fees Belonging to the Designated Offices*

28.1[A] *Fees Belonging to the Designated Offices (Alternative A)*

The fees referred to in Rule 9.1[A](a)(ii) and (iii), Rule 13.1[A](a)(ii), and Rule 23.3[A] as far as it refers to Rule 9.1[A](a)(ii) and (iii), shall belong to the designated Offices.

28.2[A] *Distribution and Transfer of Fees*

The total amount of the fees referred to in Rule 28.1[A] collected by the International Bureau in respect of international registrations, recordings of requests for later designations, and recordings of renewals effected in any given calendar year, shall be distributed among and transferred to the Contracting States in the course of the next subsequent calendar year in proportion to the number of cases in which they have been designated, provided that the number resulting for each State has first been multiplied:

(i) by 2, if the national law provides only for examination of "absolute grounds of nullity,"

(ii) by 3, if the national law provides for examination as to whether there is conflict with another mark ("relative grounds of nullity") and if such examination is carried out only where there is a third-party opposition,

(iii) by 4, if the national law provides for examination of relative grounds of nullity ex officio and without third-party opposition,

(iv) by 5, if the national law provides for examination of relative grounds of nullity ex officio followed by the possibility of third-party opposition.

Further details shall be provided in the Administrative Instructions.

28.1[B] *Fees Belonging to the Designated Offices (Alternative B)*

Any fee collected by the International Bureau under Rule 9.1[B](a)(ii), Rule 13.1[B](a)(ii), and Rule 23.3[B](a)(ii), shall belong to the designated Office of the State in respect of which it was paid.

28.2[B] *Transfer of Fees*

The International Bureau shall in every calender year transfer to any interested designated Office the fees referred to in Rule 28.1[B] and collected in respect of international registrations, recordings of requests for later designations, and recordings of renewals, effected in the preceding calendar year. Further details shall be provided in the Administrative Instructions.

## RULE 29

### *Fees Belonging to the International Bureau*

29.1 *Fees Belonging to the International Bureau*

All fees and charges collected under the Treaty, these Regulations and the Administrative Instructions, except those referred to in Rule 28, shall belong to the International Bureau.

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## RULE 29*bis*

### *Changes in the National Register*

29*bis*.1 *Notification of Changes*

The notification provided for in Article 18*bis*(1) shall be made on a form furnished by the International Bureau and the details of which are provided in the Administrative Instructions.

29*bis*.2 *Annotation and Publication*

The Administrative Instructions provide for the extent to which annotations of any changes notified under Article 18*bis*(1) shall be made in the International Register of Marks and shall be published by the International Bureau, provided that such annotation and such publication shall at least indicate the international registration number of the mark, the State which it concerns, the date on which it was received, and its subject matter (change in ownership, change in list of goods and/or services, etc.).

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## RULE 30

### *The Gazette*

30.1 *Contents and Title of the Gazette*

(a) All matters which, according to the Treaty or these Regulations, the International Bureau is obliged to publish shall be published in a periodical entitled "International Marks Gazette/*Gazette internationale des marques*" (hereinafter referred to as "the Gazette").

(b) The Administrative Instructions may provide for the inclusion of other matters in the Gazette.

30.2 *Frequency of Issue of the Gazette*

The Gazette shall be issued once a week.

30.3 *Languages of the Gazette*

(a) The Gazette shall be issued in a bilingual (English and French) edition.

(b) The Administrative Instructions shall identify those portions which require translation (for example, the lists of goods and/or services) and those portions which do not require translation (for example, the names of the designated States).

(c) Matters which can be easily understood even if not translated (for example, the names of the designated States, or which are indicated by signs or abbreviations (for example, "Ren." for "Renewal/*Renouvellement*") to which the keys shall be published in each issue, need not be translated. The details shall be provided in the Administrative Instructions.

(d) Matters not falling within the scope of paragraph (c) (for example, the lists of goods and/or services) shall always be published in both languages. The publication shall indicate which is the original language. Translations shall be prepared by the International Bureau. In case of any divergence between the original and the translation, all legal effects shall be governed by the original.

30.4 *Sale of the Gazette*

The subscription and other sale prices of the Gazette shall be fixed in the Administrative Instructions.

30.5 *Copies of the Gazette for National Offices*

(a) Before July 1 of each year each national office shall notify the International Bureau of the number of copies of the Gazette which it wishes to receive in the next subsequent year.

(b) The International Bureau shall make the requested number of copies available to the national Office:

(i) free of charge, up to the same number as the number of units corresponding to the class chosen under the Paris Convention by the Contracting State of which the said Office is the national Office,

(ii) at half of the ordinary subscription or sale price for copies in excess of the said number.

(c) Copies given free of charge or sold under paragraph (b) shall be for the internal use of the national Office which has requested them.

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RULE 31

*Copies and Other Information Available to the Public*

31.1 *Copies and Information Concerning International Applications and Registrations*

(a) Any person may obtain from the International Bureau, against payment of a fee whose amount shall be fixed in the Administrative Instructions, certified or uncertified copies or extracts of any document in the file of any international application or registration.

(b) On request and against payment of a fee whose amount shall be fixed in the Administrative Instructions, any person may obtain from the International Bureau oral or written information on any fact appearing in any document in the file of any international application or registration.

31.2 *Authentication of Documents Issued by the International Bureau*

No authority of any Contracting State shall ask for the authentication by any person or authority of certificates issued and of copies or other documents certified by the International Bureau, provided such certificates, certified copies or other certified documents bear the seal of the International Bureau and the signature of the Director General or a person acting under his authority.

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RULE 32

*Regional Marks*

[*Note by the International Bureau*: Proposals will be made after consultation with the African and Malagasy Industrial Property Office (OAMPI) and the Benelux Trademark Office.]

RULES CONCERNING CHAPTER II

RULE 101

*Expenses of Delegations*

101.1 *Expenses Borne by Governments*

The expenses of each Delegation participating in any session of the Assembly and in any committee, working group or other meeting dealing with matters of concern to the Union shall be borne by the Government which has appointed it.

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RULE 102

*Absence of Quorum in the Assembly*

102.1 *Voting by Correspondence*

(a) In the case provided for in Article 101(5)(b), the International Bureau shall communicate any decision of the Assembly (other than decisions relating to the Assembly's own procedure) to the Contracting States which were not represented when the decision was made and shall invite them to express in writing their vote or abstention within a period of 3 months from the date of the communication.

(b) If, at the expiration of the said period, the number of Contracting States having thus expressed their vote or abstention attains the number of Contracting States which was lacking for attaining the quorum when the decision was made, that decision shall take effect provided that at the same time the required majority still obtains.

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RULE 103

*Administrative Instructions*

103.1 *Matters Governed by the Administrative Instructions*

The Administrative Instructions referred to in Article 104(1)(b) shall contain provisions:

(i) concerning matters in respect of which these Regulations expressly refer to such Instructions,

(ii) concerning any details in respect of the application of these Regulations.

103.2 *Control by the Assembly Under Article 104(1)(b)*

The Assembly may invite the Director General to modify any provision of the Administrative Instructions, and the Director General shall proceed accordingly.

103.3 *Publication and Effective Date*

(a) The Administrative Instructions and any modification thereof shall be published in the Gazette.

(b) Each publication shall specify the date on which the published provisions become effective. The date need not be the same for all the provisions provided that no provision may be declared effective prior to its publication in the Gazette.

# PATENT OFFICE NOTICES

## TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

### Chapter I—Patent Office, Department of Commerce

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

*Trademark Application and Drawing Requirements*

A proposal was published at 36 F.R. 18002 to amend and revise §§ 2.21–2.23, 2.52, and 2.56. Pursuant to this notice, a number of comments have been received from interested persons. In light of the comments submitted, some changes have been made in the rules as proposed.

An additional subparagraph has been added to § 2.21 requiring that the application state the name of the applicant. In the same section, a paragraph (c) has been added. This paragraph incorporates the substances of proposed § 2.22. Section 2.52 has been revised to state that drawings must be 8 to 8½ inches wide and 11 inches long. In view of the change in § 2.52, § 2.31 has also been revised to make it clear that applications submitted on either letter or legal-size paper are acceptable.

*Effective date.* This revision shall become effective on *February 1, 1972.* However, as to § 2.52, drawings which comply only with the existing rule will be accepted until March 1, 1972.

1. Section 2.21 is revised to read as follows:

§ 2.21 *Requirements for receiving a filing date.*

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an application until all of the following elements are received:

(1) Name of the applicant;

(2) A name and address to which communications can be directed;

(3) A drawing or other identification of the mark sought to be registered;

(4) An identification of goods or services;

(5) At least one specimen or facsimile of the mark as actually used;

(6) A date of first use of the mark in commerce, or a certification or certified copy of a foreign registration if the application is based on such foreign registration pursuant to section 44(e) of the act, or a claim of the benefit of a prior foreign application in accordance with section 44(d) of the act;

(7) The required filing fee for at least one class of goods or services.

Compliance with one or more of the rules relating to the elements specified above may be required before the application is further processed.

(b) The filing date of the application is the date on which all of the elements set forth in paragraph (a) of this section are received in the Patent Office.

(c) If the papers are so defective that they cannot be accepted, the applicant will be notified and the papers and fee held 6 months. If the requirements for receiving a filing date have not been satisfied within such time, the papers and fee will be returned to the applicant or otherwise disposed of; the drawing or fee of an unaccepted application may be transferred to a later application.

§ 2.22 *[Revoked]*

2. Section 2.22 is revoked.

3. Section 2.23 is revised to read as follows:

§ 2.23 *Serial number.*

Applications will be given a serial number as received, and the applicant will be informed of the serial number and the filing date of the application.

4. Section 2.31 is revised to read as follows:

§ 2.31 *Application must be in English.*

The application must be in the English language and plainly written on but one side of the paper. It is deemed preferable that the application be on legal or letter-size paper, typewritten double spaced, with at least a one and one-half inch margin on the left-hand side and top of the page.

5. Section 2.52 is amended by revising paragraph (c) to read as follows:

§ 2.52 *Requirements for drawings.*

* * * * * *

(c) *Size of paper and margins.* The size of the sheet on which a drawing is made must be 8 to 8½ inches wide and 11 inches long. One of the shorter sides of the sheet should be regarded as its top. When the figure is longer than the width of the sheet, the sheet should be turned on its side with the top at the right. The size of the mark must be such as to leave a margin of at least 1 inch on the sides and bottom of the paper and at least 1 inch between it and the heading.

* * * * * *

6. Section 2.56 is revised to read as follows:

§ 2.56 *Specimens.*

The application must include five specimens of the trademark as actually used on or in connection with the goods in commerce. The specimens shall be duplicates of the actual used labels, tags, or containers, or the displays associated therewith or portions thereof, when made of suitable flat material and of a size not to exceed 8½ inches wide and 13 inches long.

Dated: January 11, 1972.

RICHARD A. WAHL,
*Acting Commissioner of Patents.*

Approved:

JAMES H. WAKELIN, JR.,
*Assistant Secretary*
*for Science and Technology.*

[FR Doc. 72-924; Filed 1-20-72; 8:48 am]

*Published in 37 FR 931; Jan. 21, 1972*

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## TRADEMARKS

### Initial Processing of Applications

On February 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or

not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

*Effective date.* The procedure outlined in this notice will become effective February 1, 1972.

RICHARD A. WAHL,
*Acting Commissioner of Patents.*

January 11, 1972.

Approved:

JAMES H. WAKELIN, JR.,
*Assistant Secretary for Science and Technology.*

[FR Doc. 72-925; Filed 1-20-72; 8:48 am]

*Published in 37 FR 942; Jan. 21, 1972*

## Certificates of Correction for the Week of Feb. 22, 1972

| | | | |
|---|---|---|---|
| 3,258,802 | 3,580,477 | 3,589,742 | 3,597,690 |
| 3,370,578 | 3,580,531 | 3,589,825 | 3,597,751 |
| 3,372,006 | 3,580,848 | 3,589,989 | 3,598,135 |
| 3,421,133 | 3,580,875 | 3,590,227 | 3,598,283 |
| 3,465,044 | 3,581,054 | 3,590,468 | 3,598,379 |
| 3,470,205 | 3,582,050 | 3,590,771 | 3,598,384 |
| 3,471,685 | 3,582,207 | 3,590,824 | 3,598,429 |
| 3,509,878 | 3,582,650 | 3,590,892 | 3,598,485 |
| 3,527,747 | 3,582,708 | 3,591,341 | 3,598,580 |
| 3,542,502 | 3,582,814 | 3,591,405 | 3,598,845 |
| 3,554,683 | 3,583,189 | 3,591,464 | 3,599,326 |
| 3,555,027 | 3,584,084 | 3,591,627 | 3,599,355 |
| 3,555,182 | 3,584,125 | 3,591,881 | 3,599,568 |
| 3,560,461 | 3,584,459 | 3,592,527 | 3,599,609 |
| 3,562,494 | 3,584,467 | 3,592,807 | 3,599,970 |
| 3,562,611 | 3,584,779 | 3,592,910 | 3,600,163 |
| 3,564,016 | 3,585,163 | 3,593,015 | 3,600,478 |
| 3,564,328 | 3,585,205 | 3,593,592 | 3,600,573 |
| 3,566,940 | 3,585,348 | 3,593,597 | 3,601,016 |
| 3,567,789 | 3,585,524 | 3,594,086 | 3,601,750 |
| 3,568,142 | 3,585,690 | 3,594,261 | 3,602,224 |
| 3,568,734 | 3,586,949 | 3,594,352 | 3,602,344 |
| 3,572,775 | 3,587,175 | 3,594,421 | 3,605,256 |
| 3,574,701 | 3,587,245 | 3,594,574 | 3,605,760 |
| 3,575,281 | 3,587,516 | 3,594,607 | 3,605,989 |
| 3,576,319 | 3,587,750 | 3,595,075 | 3,607,413 |
| 3,577,026 | 3,587,858 | 3,595,814 | 3,607,775 |
| 3,578,470 | 3,588,076 | 3,596,116 | 3,609,519 |
| 3,578,556 | 3,588,095 | 3,596,163 | 3,613,044 |
| 3,578,702 | 3,588,612 | 3,596,700 | |
| 3,578,742 | 3,588,679 | 3,596,767 | |
| 3,579,627 | 3,588,813 | 3,596,987 | |

## Dedications

2,898,266.—*Robert L. Gates*, Medina, N.Y. CONTROL OF PLANT DISEASES OF ASCOMYCETES ORIGIN EMPLOYING N-PHENYL-DICHLOROMALEIMIDE. Patent dated Aug. 4, 1959. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,936,734.—*Frank K. Chestnut, Jr.*, Middleport, and *Laurence G. Mayne*, Corfu, N.Y. SELF-DISPENSING FEEDING STATION. Patent dated May 17, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,945,780.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated July 19, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,955,069.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Oct. 4, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,955,070.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Oct. 4, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,960,431.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Nov. 15, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,960,432.—*Howard A. Jones* and *John R. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Nov. 15, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,961,370.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Nov. 22, 1960. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,970,939.—*Eldon Gene Maitlen*, Middleport, N.Y. CONTROL OF NEMATODES EMPLOYING N-NITROSO-N,N-DIMETHYLAMINE. Patent dated Feb. 7, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,990,315.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated June 27, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,990,316.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated June 27, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

2,995,488.—*Howard A. Jones* and *John A. Garman*, Baltimore, Md., and *Berton C. Dickinson*, Lyndonville, N.Y. SYNERGISTIC INSECTICIDAL COMPOSITIONS. Patent dated Aug. 8, 1961. Dedication filed Nov. 4, 1971, by the assignee, *FMC Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

## Patents Available for Licensing or Sale

D. 222,798. HAND-E-HOSE REEL. Stanley Erickson, 7358 23rd NW., Seattle, Wash., 98107.

3,145,728. WATER FEED CONTROL VALVE FOR WATERING TROUGHS. Vance C. Sterrett, 501 West Linden Ave., Logansport, Ind., 46947.

3,195,125. TELEVISION AID TO AIRCRAFT INSTRUMENT LANDING. Henry Reitler, P.O. Box 785, Nashville, Tenn., 37202.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poinciana Drive, Martinez, Ga., 30907.

3,541,362. ELECTROMAGNETIC GENERATORS. Robert Proulx. Correspondence to: Southwest International, Inc., P.O. Box 374, Albuquerque, N. Mex., 87103.

3,563,237. DISTAL PHALANX BANDAGE. Edwin L. Maxwell, Washington, D.C. Correspondence to: Millen, Raptes & White, 503 Crystal Mall, Bldg. 1, 1911 Jefferson Davis Highway, Arlington, Va., 22202.

3,587,105. PICTURE FRAMED ANTENNA. W. Edwin Neilson, 255 East Wendy Way, King of Prussia, Pa., 19406.

3,591,011. APPARATUS FOR SEPARATING SOLID PARTICLES FROM A FLUID MEDIUM. Heinz Holter, et al., Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,591,925. LINE ANGLE DEGREE LEVEL INSTRUMENT. Frank Dupin, 3170 Grandview Ave., Waukegan, Ill., 60085.

3,603,823. MAGNETIC MOTOR WITH PLURALITY OF STATORS. Elmer B. Mason, 901 Vickie Drive., Del City, Okla., 73115.

3,611,633. METHOD AND APPARATUS FOR OUTDOOR FLOWER ARRANGEMENTS. Clarice W. Shackelford, 3628 13th St. NW., Washington, D.C., 20010.

3,612,049. PERSONAL HUMIDIFIER. Cecil C. Schmidt, 1630 Midwest Plaza Bldg., Minneapolis, Ind., 55402.

3,618,059. ELECTRONIC DETECTION AND TRACING MEANS. Milton F. Allen, 551 E. College Ave., P.O. Box 789, Decatur, Ga., 30031.

3,623,103. CONTINUOUSLY INDICATING RADIO DIRECTION FINDER. Charles A. Baldwin, 3406 Old Dominion Road, Alexandria, Va., 22305.

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Eastman Kodak Company announces that, in accordance with its policy, nonexclusive licenses upon reasonable terms are available to responsible applicants under the following U.S. patent.

This offer is consistent with the present practice of Eastman Kodak Company generally to grant nonexclusive licenses under unexpired U.S. patents on photographic inventions issued to Kodak prior to 1967 and on inventions made in the course of research or development work for the U.S. Government.

Applications for license may be addressed to Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,226,816. METHOD AND MACHINE FOR PACKAGING ROLL FILM.

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Monsanto Research Corporation is prepared to grant licenses, at reasonable royalties, to domestic manufacturers under the following twenty-one Fuel Cell Patents (some of which are already licensed).

Applications for licenses may be addressed to L. Bruce Stevens, Jr., Manager, Patents, Monsanto Research Corporation, P.O. Box 8, Station B, Dayton, Ohio, 45407.

| | |
|---|---|
| 3,252,837 | 3,444,001 |
| 3,260,620 | 3,454,429 |
| 3,293,080 | 3,454,430 |
| 3,368,922 | 3,457,113 |
| 3,382,103 | 3,479,227 |
| 3,385,736 | 3,508,694 |
| 3,395,047 | 3,542,597 |
| 3,436,268 | 3,553,028 |
| 3,438,816 | 3,570,260 |
| 3,442,715 | 3,617,388 |
| 3,444,000 | |

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The RCA Corporation offers to grant nonexclusive licenses on reasonable terms and conditions under patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,623,147. APPARATUS FOR CONTACT PRINTING.

3,625,593. ELECTRICAL CONTROL OF LIGHT POLARIZATION UTILIZING THE OPTICAL PROPERTY OF FLUIDS.

3,625,760. MAGNETIC RECORDING MEDIUM WITH LUBRICANT.

3,626,238. THYRISTOR CONTROLLED POWER SUPPLY CIRCUITS AND DEFLECTION CIRCUITRY ASSOCIATED WITH A KINESCOPE.

3,626,242. POWER SUPPLY CIRCUITS.

3,626,511. DIGITAL LIGHT DEFLECTOR USING ELECTRO-OPTIC GRATING.

3,627,392. STEREOPHONIC SOUND REPRODUCING APPARATUS.

3,627,526. ELECTROPHOTOGRAPHIC RECORDING ELEMENTS WITH HALF-TONE SCREEN COATINGS THEREON.

3,627,528. ELECTROPHOTOGRAPHIC RECORDING ELEMENT HAVING PHOTOCONDUCTOR WITH QUENCHED LUMINESCENCE DURING CHARGING AND METHOD OF MAKING THE PHOTOCONDUCTOR.

3,627,599. METHOD OF APPLYING AN N,N'DIALLYLMELAMINE RESIST TO A SURFACE.

3,628,070. VOLTAGE REFERENCE AND VOLTAGE LEVEL SENSING CIRCUIT.

3,628,082. LINEARITY CORRECTION CIRCUIT UTILIZING A SATURABLE REACTOR.

3,628,152. TELEVISION TUNING CIRCUIT UTILIZING VOLTAGE VARIABLE CAPACITANCE.

3,628,166. WIDE-BAND AMPLIFIER.

3,628,170. LSA OR HYBRID MODE OSCILLATOR STARTED BY SERIES CONNECTED GUNN OR QUENCHED MODE OSCILLATOR.

3,628,177. OPTICAL MODULATION SYSTEM.

3,628,847. HOLOGRAM MEMORY.

3,628,869. AUTOCOLLIMATOR INCLUDING A RETROFLECTOR ELEMENT.

3,629,494. SIGNAL PROCESSOR FOR DROPOUT CORRECTION BEFORE DEMODULATION.

3,629,503. DIGITAL SYNCHRONIZATION SYSTEM.

3,629,519. MAGNETIC HEADS WITH POLES JOINED BY MOLECULAR TRANSPORT BONDING.

3,629,611. ELECTRONIC PROCESSING APPARATUS.

3,629,612. OPERATION OF FIELD-EFFECT TRANSISTOR CIRCUIT HAVING SUBSTANTIAL DISTRIBUTED CAPACITANCE.

3,629,691. CURRENT SOURCE.

3,629,692. CURRENT SOURCE WITH POSITIVE FEEDBACK CURRENT REPEATER.

3,629,721. ORTHOGONAL FILTERS.

3,629,734. BROADBAND DOUBLE RIDGE WAVEGUIDE MAGIC TEE.

3,629,737. TRANSMISSION LINE FORMED BY A DIELECTRIC BODY HAVING A METALLIZED NONPLANAR SURFACE.

3,629,956. TEACHING AND GAME PLAYING MACHINE.

3,630,594. HOLOGRAPHIC SCAN CONVERTER.

3,631,131. METHOD OF RECONSTITUTING UNFIRED, CAST, ALUMINA SCRAP.

3,631,348. SIGNAL DISTRIBUTION SYSTEM.

3,631,411. ELECTRICALLY AND OPTICALLY ACCESSIBLE MEMORY.

3,631,417. CYLINDRICAL MAGNETIC MEMORY CONSTRUCTION.

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General Electric Company is prepared to grant non-exclusive licenses under the following 41 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,571,773. CENTER CLAMPED BUSHING TRANSFORMER.

Applications for licenses under the following patent may be addressed to: Patent Counsel, Telecommunication Products Department, General Electric Company, Lynchburg, Va., 24502.

3,603,917. MOUNTING DEVICE FOR A WOUND INDUCTOR.

Applications for licenses under the following 3 patents may be addressed to: General Electric Company, Patent Counsel, Housewares Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

3,007,029. TEMPERATURE RESPONSIVE CONTROL FOR ELECTRICALLY HEATED DEVICES.

3,189,995. LID HOLDING MEANS FOR CAN OPENERS.

3,439,417. CAN OPENER.

Applications for license under the following 12 patents may be addressed to: General Electric Company, Aircraft Engine Group, 1000 Western Ave., Lynn, Mass., 01910. Attention: Patent Counsel.

3,106,094. DIFFERENTIAL PRESSURE APPARATUS.

3,158,912. CONTROLLED GRAIN SIZE CASTING.

3,208,847. CHROMIUM BASE ALLOY.

3,268,093. OBJECT HANDLING SYSTEM.

3,365,251. SEAL ASSEMBLY FOR ANTIFRICTION BEARINGS.

3,514,955. MIXING STRUCTURES AND TURBOFAN ENGINES EMPLOYING SAME.

3,514,957. HIGH SPEED PROPULSION ENGINE.

3,526,953. METHOD FOR MAKING LIGHTWEIGHT METALLIC STRUCTURE.

3,540,214. FUEL SYSTEMS FOR GAS TURBINE ENGINES.

3,540,811. FLUID COOLED TURBINE BLADE.

3,548,204. ELECTRICAL FUNCTION GENERATOR.

3,598,319. PROPULSION NOZZLES.

Applications for license under the following 17 patents may be addressed to: Patent Counsel LSTG-I & MT Divisions, General Electric Company, 1 River Road, Bldg. No. 43, Schenectady, N.Y., 12305.

3,135,322. LIQUID COOLED CONDENSER.

3,407,681. FACE GEAR AND METHOD OF ITS MANUFACTURE.

3,422,831. TURBINE CONTROL SYSTEM.

3,429,557. STEAM TURBINE ROTOR COOLING ARRANGEMENT.

3,443,550. TWO-SECTION HEAT RECOVERY STEAM GENERATOR.

3,443,633. TEMPERATURE COMPENSATED AIR-COOLED STEAM CONDENSER.

3,453,181. EVAPORATOR UNIT WITH INTEGRAL LIQUID HEATER.

3,505,811. CONTROL SYSTEM FOR A COMBINED GAS TURBINE AND STEAM TURBINE POWER PLANT.

3,547,085. STEAM DRUM BAFFLE ARRANGEMENT FOR A FORCED RECIRCULATION STEAM GENERATOR.

3,573,460. ION CHAMBER DETECTOR FOR SUB-MICRON PARTICLES.

3,588,562. INSULATED SHAFT ATTACHMENT FOR ROTATING CONDUCTING RING AND METHOD OF ATTACHING.

3,597,653. DIGITAL LOW SPEED SWITCH.

3,600,162. COBALT IRON MAGNETIC ALLOYS.

3,601,617. TURBINE CONTROL SYSTEM WITH EARLY VALVE ACTUATION UNDER UNBALANCED CONDITIONS.

3,601,642. MULTI-THREE PHASE WINDING WITH INTERCHANGED CIRCUIT SEQUENCE.

3,601,643. ANTI-EROSION FEED SLOT FOR LIQUID METAL COLLECTOR.

3,604,206. SHAFT SEALING SYSTEM FOR NUCLEAR TURBINES.

## Erratum

In the OFFICIAL GAZETTE of Feb. 1, 1972, the following patent listed as being available for licensing or sale offered by: "Seymour H. Miller, Executive Vice President, Masterpiece, Inc., 29 Elm Ave., Mount Vernon, N.Y., 10550." should read as follows: *Masterpiece, Inc., % American Technical Industries, Inc., 200 5th Ave., New York, N.Y., 10010, Attn: Seymour H. Miller, Executive Vice President.*

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 8, 1972

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-06-71 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 8-04-70 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 10-23-70 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 1-25-71 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 8-10-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 6-08-71 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 8-20-70 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 2-03-71 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 3-04-71 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 1-04-71 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 1-04-71 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 1-06-71 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 12-08-70 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 12-02-70 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 2-11-71 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 1-04-71 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during February 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,700,764 to 2,702,900, inclusive
Plant Patents..... Numbers 1,345 to 1,354, inclusive

# REISSUES

## FEBRUARY 22, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### 27,290

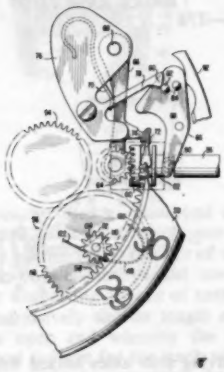
### WATCH CALENDAR SETTING MECHANISM

**Donald J. Rogers and John A. Van Horn, Lancaster, Pa., assignors to Hamilton Watch Company, Lancaster, Pa.**

**Original No. 3,427,798, dated Feb. 18, 1969, Ser. No. 593,374, Nov. 10, 1966. Application for reissue Apr. 1, 1970, Ser. No. 24,891**

**Int. Cl. G04b *19/24***

**U.S. Cl. 58—58** **19 Claims**



The watch calendar setting mechanism has a rotatable stem axially movable into three positions. A pivoted setting wheel is biased into engagement with a clutch slidably mounted on the stem. When the stem is in an innermost position, the setting wheel engages the watch winding mechanism. When the stem is in an intermediate position, the setting wheel engages the calendar ring which may then be rotated in response to rotation of the stem. When the stem is in the outermost position, the setting wheel engages a hand setting gear. The dial train continuously drives the calendar ring through a slip clutch.

### 27,291

### LATCHING DEVICE

**Roland V. Fowler, Louisville, Ky., assignor to Amerock Corporation, Rockford, Ill.**

**Original No. 3,410,591, dated Nov. 12, 1968, Ser. No. 592,137, Nov. 4, 1966. Application for reissue Mar. 12, 1970, Ser. No. 18,870**

**Int. Cl. E05c *5/00, 19/10***

**U.S. Cl. 292—113** **18 Claims**

A latch for a self-cleaning oven and comprising a handle operable to move a bolt along a first path into engagement with a strike on the oven door and then inwardly along a second path to a latched position to draw the door in tightly against the oven cabinet. A spring acting on the bolt normally holds the bolt for movement in its first path and prevents the bolt from moving inwardly to its latched position unless the door is closed and the bolt actually engages the strike to create a force overcoming the spring force.

### 27,292

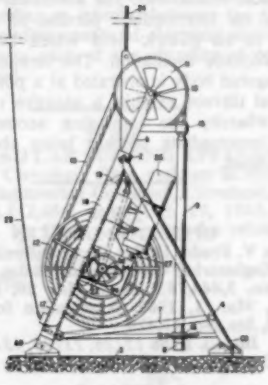
### APPARATUS FOR SUBMARINE CORE DRILLING

**Pierre Grolet, Pierre Moulin, and Jean Parola, Rueil Malmaison, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France**

**Original No. 3,370,656, dated Feb. 27, 1968, Ser. No. 510,285, Nov. 29, 1965. Application for reissue Feb. 27, 1970, Ser. No. 15,305**

**Int. Cl. E21b *7/12***

**U.S. Cl. 175—6** **5 Claims**



A submarine core drilling apparatus comprising a basic structure which is suspended by a supporting cable from the surface installation. A flexible conduit is wound upon a storage reel which in turn is carried by the basic structure. The free end of the conduit is connected to a rigid tubular part comprising a bottom motor operatively connected to a core drill at its lower end. The apparatus further comprises means for guiding the rigid tubular part above the sea bottom, means supported by the basic structure for feeding water under pressure into the conduit, means associated with the conduit storage reel to control

the unwinding of the flexible conduit when the core drill is lowered and advanced into the underwater strata, and at least one cable which may or may not be distinct from the supporting cable. This cable contains electric power and has control and command conductors connected to a source of electric energy and a switchboard on the surface installation.

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27,293

## SEMICONDUCTOR DEVICE FOR PRODUCING AND AMPLIFYING ELECTRICAL SIGNALS OF VERY HIGH FREQUENCY

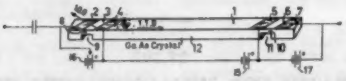
Robert Vellex, Paris, France, by U.S. Philips Corp., assignee, New York, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 3,458,831, dated July 29, 1969, Ser. No. 644,001, June 6, 1967. Application for reissue Feb. 12, 1970, Ser. No. 14,883

Claims priority, application France, June 10, 1966, 65,098

Int. Cl. H03b *5/32, 7/14;* H03f *3/04*

U.S. Cl. 331—107 A 12 Claims



A semiconductor device for producing and amplifying electrical high frequency signals comprising an elongate body of monocyrstalline piezoelectric material which exhibits a negative resistance characteristic over a portion of the current-voltage characteristic thereof. The body which may consist of gallium arsenide and cut with its longest dimension in the (1.1.0) direction has one end thereof operated at a field intensity at which the material exhibits its negative resistance characteristic thereby to generate at this end electrical and concurrent acoustical oscillations. The acoustical oscillations are coupled to the intermediate portion of the rod which is subject to an electric field which brings about an amplified acoustic oscillation. The terminal end portion of the elongated body is operated at a potential at which the material thereof exhibits a negative resistance characteristic whereby the impinging acoustic oscillations from the intermediate portion bring about an output amplified signal.

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27,294

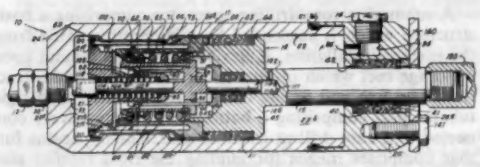
## OPERATOR DEVICES

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Original No. 3,444,783, dated May 20, 1969, Ser. No. 435,990, Mar. 1, 1965. Application for reissue Feb. 18, 1970, Ser. No. 12,420

Int. Cl. F15b *15/26, 11/00, 13/00*

U.S. Cl. 91—41 20 Claims



A pressure fluid actuated operator device movable to at least two positions for operating other devices and adapted to be releasably locked in each of said positions, having fluid pressure differential pulse code signal responsive operator means for actuating and releasing the locking means of said operator device in response to selected predetermined pulse code pressure differential signals transmitted to said operator device from a remote source of pressure fluid; and a system utilizing a plurality of said operator devices in which each is selectively operated in response to a predetermined selected pulse code pressure differential signal transmitted to all of said operator means by fluid pressure.

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27,295

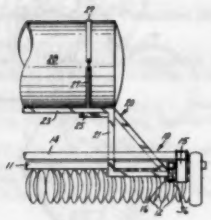
## APPLICATOR APPARATUS ATTACHABLE TO A WHEELED AGRICULTURAL IMPLEMENT

Joseph H. Pechacek, 1050 Blaine, Woodburn, Oreg. 97071

Original No. 3,526,342, dated Sept. 1, 1970, Ser. No. 743,715, July 10, 1968. Application for reissue Oct. 16, 1970, Ser. No. 81,434

Int. Cl. A01c *23/00*

U.S. Cl. 222—176 1 Claim



A frame having stub axles affixed thereto for suspending the frame on the wheels of an agricultural implement so that the frame extends above the instrument and supports a material container thereabove, for various tasks such as spraying weeds, fertilizing, etc., while adding very little, if any, weight to the frame of the agricultural implement.

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27,296

## PROCESS FOR THE PREPARATION OF AROMATIC CARBOXYLIC ACIDS

Yataro Ichikawa, Iwakuni, Japan, assignor to Teijin Limited, Kita-ku, Osaka, Japan

No Drawing. Original No. 3,299,125, dated Jan. 17, 1967, Ser. No. 362,488, Apr. 24, 1964. Application for reissue June 9, 1969, Ser. No. 871,487

Claims priority, application Japan, May 1, 1963, 38/22,901

Int. Cl. C07c *63/02*

U.S. Cl. 260—524 R 11 Claims

*A process for producing aromatic carboxylic acids comprising reacting under conditions of oxidation, an aromatic compound having at least one substituent selected from methyl, hydroxymethyl and aldehyde radicals in the presence of a catalyst system containing in combination (A) at least one substance selected from the group consisting of scandium, yttrium, lanthanum, neodymium, gadolinium, thorium, zirconium and hafnium and the organic acid salts, inorganic salts, oxides, hydroxides, basic salts, complex salts and alcoholates thereof, and (B) at least one substance selected from the group consisting of the metal cobalt, organic acid salts, oxides, hydroxides and complex salts of the metal cobalt. When two substituents are present on the aromatic compound, they should be separated by at least one unsubstituted nuclear carbon.*

27,297

## DISPENSER WITH CUP SUPPORTING BRISTLES

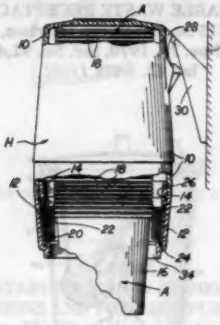
Howard W. Johnson and Giacinto C. D'Ercoli, Park Forest, and Elmer J. Knize, Chicago, Ill., assignors to Solo Cup Company, Chicago, Ill.

Original No. 3,342,375, dated Sept. 19, 1967, Ser. No. 531,842, Mar. 4, 1966. Application for reissue June 16, 1969, Ser. No. 835,905

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. A47f *1/04*

U.S. Cl. 221—308 10 Claims



The specification discloses a cylindrical dispenser for paper or plastic cups having a tapered open end through which the cups are put into or taken out of the dispenser. At the lower open end, bristles project toward the axis of the cylinder for supporting a stack of nested cups. The bristles are of progressively shorter length and therefore stiffer toward the open end whereby the lower stiffer bristles provide good support for the stack while the longer, less stiff bristles assist in separating the nested cups to facilitate removing only one at a time.

27,298

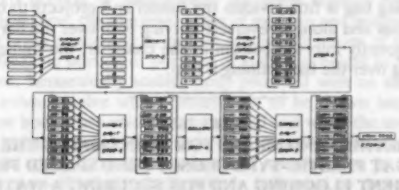
## PROCESS OF PRINTING NUMBERS ON FORMS

Arthur S. Folino, 444 Stone Mill Road, Dayton, Ohio 45409

Original No. 3,421,752, dated Jan. 14, 1969, Ser. No. 488,331, Sept. 20, 1965. Application for reissue Jan. 20, 1970, Ser. No. 4,431

Int. Cl. B41f *13/54;* B41l *45/00;* B65h *45/16*

U.S. Cl. 270—1 13 Claims



A method of applying consecutive numbers of multiple denominational position to ticket and like forms without the use of numbering devices, including steps of imprinting in successive denominational positions and of collating the ticket forms intermediate imprinting operations to form numerically related groups and sets within groups.

27,299

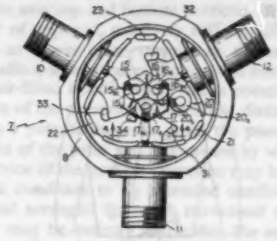
## N-WAY ELECTRICAL POWER DIVIDER WHEREIN N IS AN ODD NUMBER

Joseph Oleksiak, Dudley, Mass., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Original No. 3,428,920, dated Feb. 18, 1969, Ser. No. 597,650, Nov. 29, 1966. Application for reissue Mar. 10, 1970, Ser. No. 18,357

Int. Cl. H01p *5/12*

U.S. Cl. 333—8 9 Claims



An electrical network for summing or dividing high-frequency electrical power. Any odd number of high frequency electircal power inputs can be summed and the sum will appear at a single output port or, alternatively, a single high-frequency input can be divided into any odd number of output, each appearing at one of a plurality of ports. The network achieves a high degree of isolation between the plurality of ports as well as close coupling between the single port and each of the plurality of ports. These ends art attained by utilizing a plurality of transformers, each having two windings, the two windings consisting of a pair of insulated wires, each twisted about the other and the toroidally wound around of ferromagnetic core. The windings are connected to each other in such a way as to bring about net cancellations of electrical signals tending to transfer between the plurality of ports and net reinforcements of electrical signals tending to ransfer between each of the plurality of ports and a common terminal.

27,300

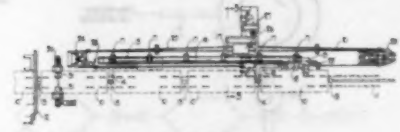
## RAILROAD CAR PUSHING APPARATUS

Carl Ludwig, Cleveland, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Original No. 3,212,454, dated Oct. 19, 1965, Ser. No. 315,237, Oct. 10, 1963. Application for reissue May 6, 1970, Ser. No. 34,971

Int. Cl. B61j *3/06*

U.S. Cl. 104—176 18 Claims



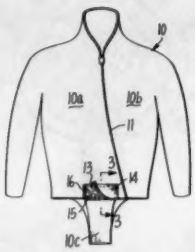
*There is provided a railroad train moving system including a train of coupled railroad cars, a track portion therefor, and characterized by a carriage movable alongside the track portion and having an arm selectively positionable into and out of train pushing position between a pair of coupled cars for applying, centrally and on or near the coupler, a force sufficient to move the train as a unit when the arm is in its train pushing position.*

# PATENTS

## GRANTED FEBRUARY 22, 1972

## GENERAL AND MECHANICAL

**3,643,264**
**UNDERWATER DIVING GARMENT CONSTRUCTION**
**Carl T. Rector, 2408 Meadow Lane, Eureka, Calif.**
**Filed Oct. 2, 1970, Ser. No. 77,609**
**Int. Cl. B63c *11/02***
**U.S. Cl. 2—2.1 R** **2 Claims**




An improved fastening means for use in the construction of an underwater diving garment having a tail strap and vest portion that extends below the waistline, said improved fastening means comprising a pair of pads having hooked surfaces, one pad being secured to the lower portion of said vest and the other pad being hinged to the vest above said first pad, the hooked surfaces of said pads being in opposed facing relation, and a woolly fabric material mounted on both sides of said tail strap for simultaneously engaging both pads while the end of said tail strap is sandwiched therebetween.

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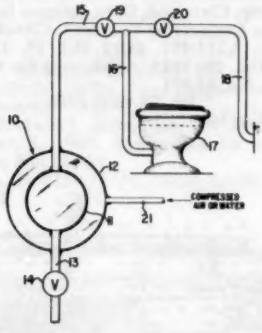
**3,643,265**
**HOLDING TANK FOR MARINE TOILET**
**George C. Wiswell, Jr., 1014 Requot Road, Southport, Conn.**
**Filed Sept. 4, 1970, Ser. No. 69,570**
**Int. Cl. E03d *1/00, 3/00, 5/00***
**U.S. Cl. 4—10** **5 Claims**




A holding tank for a marine toilet comprises a pair of flexible bags, one inside the other and separate from each other. The inner bag is connected to a high point of a siphon line between the exhaust of a marine toilet and the overflow discharge. A separate discharge line also extends from the inner bag. The outer bag is connected to a source of fluid pressure so that pressure can be applied against the inner bag to force the contents thereof through the discharge line.

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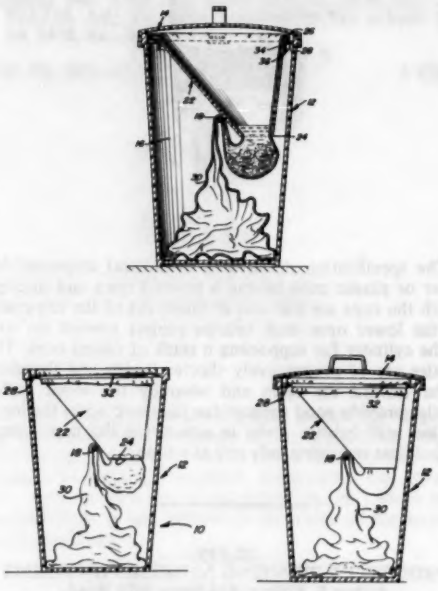
**3,643,266**
**PORTABLE WASTE RECEPTACLE**
**Robert D. Black, 515 South Liberty, Harrison, Ark.**
**Filed Nov. 24, 1970, Ser. No. 92,461**
**Int. Cl. A47k *11/02***
**U.S. Cl. 4—142** **10 Claims**




An enlarged upright cylindrical container having a removable funnel seated in the upper portion thereof. The funnel has an offset spout which lies to one side of and below a bar spanning the internal chamber of the container. A waste receiving bag is fitted within the funnel and projects through the spout and along a reversely curving path over the bar and subsequently into the bottom of the chamber, the folding of the bag over the bar defining a trap.

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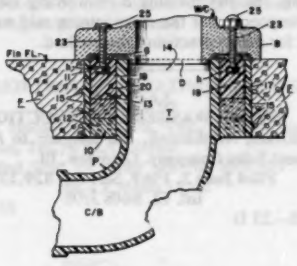
**3,643,267**
**METHOD AND MEANS FOR MAINTAINING THE THROAT PLASTIC-TYPE CLOSET BEND SPACED FROM CEMENT FLOORING AND FOR SECURING A WATER CLOSET THERETO**
**Arthur L. Winter, 54 San Carlos St., Salinas, Calif.**
**Filed May 4, 1970, Ser. No. 34,125**
**Int. Cl. E03d *11/00***
**U.S. Cl. 4—252** **9 Claims**

A guard form for circumscribing and maintaining the threat of a closet bend free and clear of cement flooring by

removable coring and the replacement of such coring by a closet fastening ring tightly fitting between the guard form



and the throat for stabilizing and securing a water closet relative thereto.

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3,643,268

## SELF-INFLATABLE HOLLOW BODIES FOR USE AS CUSHIONS AND FOR LIKE PURPOSES

Paul Stamberger, 552 West University Parkway, Baltimore, Md.

Continuation-in-part of application Ser. No. 738,657, June 20, 1968, now Patent No. 3,553,113, dated Oct. 13, 1970, which is a continuation-in-part of application Ser. No. 453,252, May 5, 1968, now abandoned. This application Sept. 30, 1970, Ser. No. 76,734

Int. Cl. A47c *27/08*

U.S. Cl. 5—348 12 Claims

The present invention relates to self-inflatable hollow bodies made of relatively flexible, strong, air-impervious sheet material, which bodies comprise a top portion and a bottom portion of substantially the same relative size and configuration, the marginal edges of said top and bottom portions being connected in airtight relation by means of a flexible, foldable portion or portions of sufficient height to form a hollow, hermetically sealed, body provided with an air inlet and exhaust valve which permits air to be drawn into said hollow body when said valve is opened and when the top portion is being moved into spaced or extended position with respect to said bottom portion and which valve is closed when the self-inflative hollow body is formed to thus retain the air within said hollow body to provide the self-inflated cushion, pillow, mattress or the like article of manufacture. As a means for moving said top and bottom portions from their normal, juxtaposed and readily foldable positions to their spaced positions to form the hollow body, there is provided a pair of opposed members whose upper and lower edges are secured to aligned portions of the top and bottom portions, which opposed members are sufficiently stiff or are made so by strengthening or reinforcing means to be stiffer or more rigid than the remaining portion of the hollow body. When the hollow body is in its normal, collapsed and readily foldable condition with the top and bottom portions in juxtaposed relation, said opposed members are disposed in substantially parallel relation with respect to the plane of the said juxtaposed top portion, and when said members are moved manually or automatically to positions at right angles to said plane, they act as levers to cause said top and bottom portions to be separated to form the hollow body, the extent of such separation being limited by the height of the flexible, foldable portion or portions which connect the marginal edges of the said top and bottom portions. It is the provision of the pair of opposed, relatively stiff or stiffened members which act as levers upon manual or automatic operation thereof to effect separation of the top and bottom portions to form the air-filled hollow body, which constitutes an important feature of the present invention and distinguishes said invention, in a patentable sense, from the pneumatic cushions and the like of the prior art. The means by which the self-inflatable device of the present invention may be moved from a normal flat condition to an extended condition are so constructed and arranged that such movement may be entirely manual or may be entirely automatic, the automatic movement being effected by the provision of novel means associated with each of the pair of opposed stiff or stiffened members which will move said opposed members from their normal flat positions substantially parallel to the plane of said top portion to their extended positions at substantially right angles with respect to the plane of said bottom portion.

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3,643,269

## DYEING SYNTHETIC POLYAMIDE FIBERS WITH DISULFONATED DIARYL BIS AXO CARBONILIDES

August Schweizer, Muttenz, Switzerland, assignor to Sandor Ltd. (also known as Sandoz A.G.), Basel, Switzerland

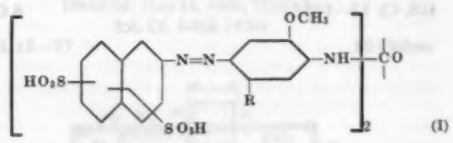
Filed Sept. 30, 1968, Ser. No. 763,925

Claims priority, application Switzerland, Oct. 25, 1967, 15022/67

Int. Cl. D06p *1/20*

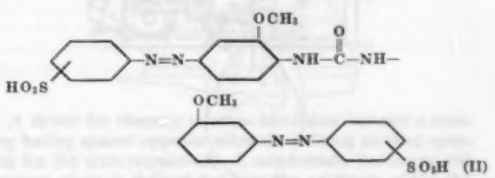
U.S. Cl. 8—41 10 Claims

"A process for dyeing or printing polyamide fibers with dyes of the formula



(I)

where R stands for methyl or ethyl, or with dyes of the formula



(II)

or their water-soluble salts."

3,643,270

## PROCESS FOR DYEING ANIONIC GROUPS CONTAINING SYNTHETIC FIBER MATERIALS

Helmut Kirschnek, Leverkusen-Schlebusch; Dietrich Hildebrand, Leverkusen, and Gunter Breidbach, Cologne-Flittard, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 12, 1969, Ser. No. 798,768
Claims priority, application Germany, Dec. 20, 1968, P 18 15 943.8
Int. Cl. D06p 5/06
U.S. Cl. 8—172 7 Claims

An improvement in the process for dyeing synthetic fibers containing anionic groups, e.g., acrylonitrile copolymers, with basic dyestuffs in chlorohydrocarbon dyebaths containing 0.1–4 percent by weight of water is obtained by utilizing a dyeing auxiliary having the formula

wherein

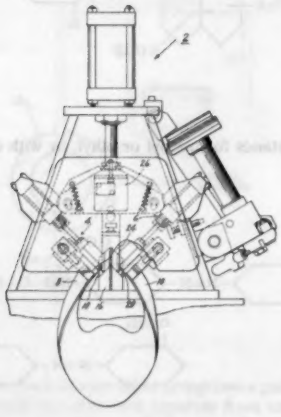
$R_1$ and $R_2$, independently of one another are $C_{14}$–$C_{22}$-alkyl or $C_{14}$–$C_{22}$-alkenyl in which the total of the carbon atoms contained in $R_1$ and $R_2$ is 32–44;
$R_3$ is lower alkyl, haloalkyl or hydroxyalkyl;
$R_4$ is optionally substituted cycloalkyl, aralkyl or $C_1$–$C_4$-alkyl, or together with $R_3$ forms a 5- or 6-membered heterocycle; and
$X^{(-)}$ is an anion.

3,643,271

## METHOD AND APPARTUS FOR SEAM FORMING

Lionel W. G. Wilkinson, Narborough, England, assignor to USM Corporation, Flemington, N.J.

Filed Aug. 24, 1970, Ser. No. 66,446
Claims priority, application Great Britain, Sept. 11, 1969, 44,907/69
Int. Cl. A43d 11/00
U.S. Cl. 12—146 C 6 Claims



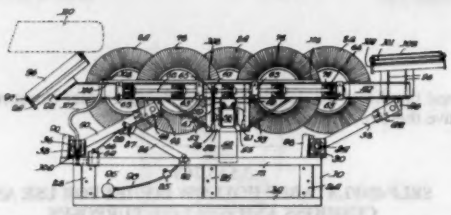
A method of forming a seam joining two workpieces, such as thermoplastic shoe parts, by supporting said parts with the edges to be seamed in adjacent relationship on a support surface having a grooved-out portion aligned with the edges to be seamed, forming a weld along said adjacent edges, flowing a portion of the weldment into the grooved-out portion during welding, thereby forming a reinforcing rib aligned with and superimposed over the seam joining said workpieces and apparatus for use in practising the method.

3,643,272

## WHEEL WASHER CONSTRUCTION

Allen D. Rickel, Northbrook, Ill., assignor to Auto Laundry Equipment Sales Company, Glenview, Ill.

Filed June 2, 1969, Ser. No. 829,257
Int. Cl. B60s 3/06
U.S. Cl. 15—21 D 3 Claims



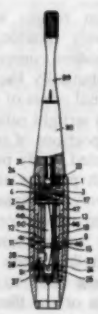
A wheel washer for use in automatic automobile laundries whereby an entire wheel, including the tire, of an automobile is washed and cleaned during one pass of the forwardly moving, rotating wheel. Staggered and stacked brush assemblies provide maximum surface cleaning of the automobile wheel in a minimum of linear travel distance. Direct chain-and-sprocket and geared driving means provide positive power delivery to the brush assemblies.

3,643,273

## AUTOMATIC TOOTHBRUSH WITH A FLUID MOTOR

Cornelis Johannes Theresia Potters; Jacobus Pieter Reinhoudt, and Hendricus Franciscus Gerardus Smulders, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,739
Claims priority, application Netherlands, Jan. 24, 1969, 6901274
Int. Cl. A46b 13/02
U.S. Cl. 15—22 R 9 Claims



An automatic toothbrush having a fluid motor, in particular a water motor, which produces reciprocating movements of a part, such as a piston, coupled to the brush proper, one

or more ports being located in the fluid supply passage and/or the fluid discharge passage, which ports can periodically be opened and closed by a member, such as a slide, which is driven by a switching mechanism the position of which is determined by the position of the pistons. Preferably a buckling spring mechanism is used.

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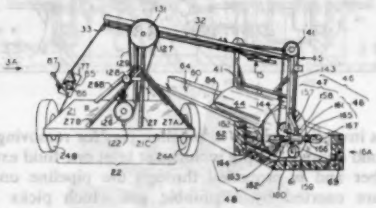
**3,643,274**
**CATTLE FEED TROUGH TREATING APPARATUS AND METHOD**
**Roy Kenneth Hodges, Stratford, Tex., assignor to Kenneth Poole, Cactus, Tex., a part interest**
**Filed Sept. 19, 1969, Ser. No. 859,393**
**Int. Cl. A46b *13/02***
**U.S. Cl. 15—56** **7 Claims**



Apparatus for treating and cleansing a feed trough having a longitudinally extending upwardly open channel of round, curved or rectangular section by the concurrent steps of supporting a cylindrical brush means having a central longitudinally extending axis in the trough channel; rotating the brush about its axis and thereby contacting and brushing said trough channel and thereby applying a force between the trough channel and rotating brush while supporting the rotating brush in the channel against that force between the rotating brush and the trough channel; and moving the brush along the length of the trough with the axis of the brush at an angle to the length of the trough channel, the brush contacting the bottom and horizontally spaced-apart vertically extending wall portions of the trough channel, in alternating combination with the step of stirring the feed in said trough by concurrent steps of supporting in said trough, pivotally about a horizontal axis above said trough, plowlike stirring means extending transversely of the length of said channel of said trough and moving said stirring means along the length of the trough through the feed in said trough. The apparatus for supporting and locating and moving the brush along the length of the trough is the same as the apparatus for supporting, locating and moving the stirring means.

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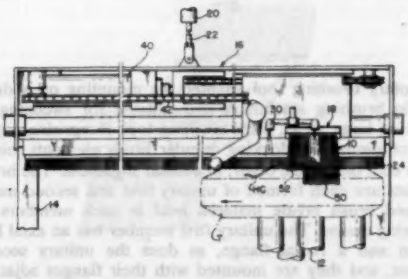
**3,643,275**
**HUBCAP WASHER**
**Russel A. Van Brakel, Wood Dale, Ill., assignor to Haverberg Auto Laundry Equipment Co., Inc., Chicago, Ill.**
**Filed Apr. 3, 1970, Ser. No. 25,503**
**Int. Cl. B60s *3/04***
**U.S. Cl. 15—21 R** **7 Claims**



A hubcap washer is provided with a brush having a beveled or tapered face that allows the maximum number of individual bristles to be cleaning or brushing at one time. The brush is mounted at an angle so that the face of the brush is disposed generally at a 90° angle with respect to the axis of rotation of the wheel. The brush in the preferred form is also stepped.

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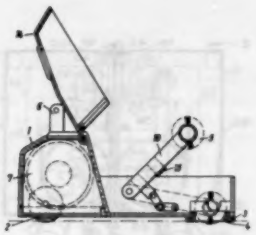
**3,643,276**
**FLOOR-CLEANING MACHINE**
**Eberhard Worwag, Stuttgart, Germany, assignor to Progress-Elektrogerate Mauz & Pfeiffer, Stuttgart, Germany**
**Filed Apr. 6, 1970, Ser. No. 25,699**
**Claims priority, application Germany, Apr. 5, 1969, G 69 13 820**
**Int. Cl. A471 *11/18***
**U.S. Cl. 15—49** **8 Claims**



A floor-cleaning machine with a cleaning tool which is adapted to be driven by a motor and is rotatably journaled between two supporting arms, said supporting arms being provided with plug-in coupling means for rotatably engaging and supporting said cleaning tool, said supporting arms together with said cleaning tool being pivotable selectively from a position within the housing to a position outside the housing and vice versa.

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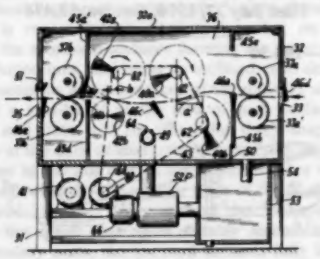
**3,643,277**
**DEVICE FOR CLEANING VENETIAN BLIND SLATS**
**Felix Durst, Oberwenigen-Schofflisdorf, Switzerland**
**Filed July 10, 1969, Ser. No. 840,732**
**Claims priority, application Switzerland, July 12, 1968, 10649/68; May 14, 1969, 7530/69**
**Int. Cl. A46b *13/04***
**U.S. Cl. 15—77** **10 Claims**



A device for cleaning venetian blind slats includes a housing having spaced opposite sidewalls defining an inlet opening for the slats respectively. A substantially horizontal slat passage plane is defined between the apertures within the housing and the clamping points of two pairs of superposed driving rolls having rubber-elastic surfaces and arranged adjacent the respective apertures and provide guiding means for the slats for delivering the slats between two horizontally spaced pairs of cleaning rolls. The apparatus also includes a horizontally arranged spray pipe connected to a pressure line

for applying a cleaning fluid in the vicinity of the space defined between the two cleaning roll pairs. The spray pipe advantageously defines a slat guide channel having a convergent entrance for guiding the slats therethrough.

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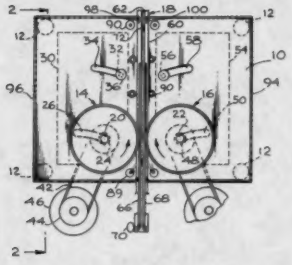
**3,643,278**

**PRINTED CIRCUIT PANEL SCRUBBING APPARATUS**

**Daniel M. Harris, Canoga Park; Jack E. Moore, Woodland Hills; Chester E. Taylor, Reseda, and Walter H. Walczyk, Oxnard, all of Calif., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Filed Apr. 13, 1970, Ser. No. 29,366**
**Int. Cl. A46b *13/02***
**U.S. Cl. 15—77** **8 Claims**



A scrubbing apparatus particularly useful for scrubbing clean the plating on the base contact fingers of printed circuit panels. The apparatus is comprised of a pair of cylindrical brushes each mounted for rotation in the same horizontal plane about spaced vertically oriented axes. The brush peripheries are closely spaced from one another to permit the passage of a circuit panel therebetween along a guide and support track. Means are provided to adjustably position the brushes to permit simultaneous scrubbing of either both sides of a single panel or one side each of a pair of panels. Adjustability also enables the brush wear to be compensated for. A source of waterflow is provided to continually wet the brush periphery.

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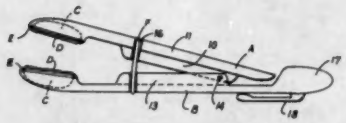
**3,643,279**

**EYEGLASS CLEANER**

**Alonzo M. De Bruhl, 11 Shrevewood Drive, Taylors, S.C.**

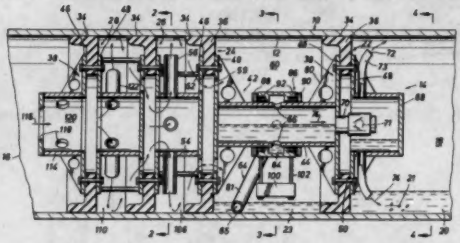
**Filed July 27, 1970, Ser. No. 58,476**
**Int. Cl. G02c *13/00***
**U.S. Cl. 15—104.94** **2 Claims**

An apparatus for applying a cleaning agent simultaneously to both sides of the lens of a pair of eyeglasses. The apparatus includes a pair of arms that are pivotally connected together, and have cup-shaped recesses carried adjacent one end thereof. Positioned within each recess is an absorbent material saturated with a cleaning agent. A rim extends around the recesses for minimizing evaporation of the cleaning agent when the arms are in a closed position.

**3,643,280**

**PIPELINE PIGS**

**Marvin D. Powers, 6060 Skyline Drive, Houston, Tex.**

**Filed Dec. 19, 1969, Ser. No. 886,629**
**Int. Cl. B08b *9/04***
**U.S. Cl. 15—104.06 R** **12 Claims**



This invention relates to pipeline pigs for removing liquids and solid debris. The pig includes at least one fluid extraction chamber and is propelled through the pipeline under the pressure exerted by a suitable gas which picks up and atomizes the liquids within the chamber. The pig preferably also includes a drying chamber from which liquids are removed through a syphon tube operated by the gas pressure. The gases, together with the extracted liquids, become ejected in front of the moving pig in the direction of fluid flow.

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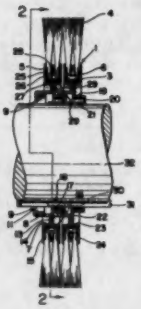
**3,643,281**

**ROTARY BRUSH**

**Arthur T. Schofield, Brecksville, Ohio, assignor to The Manufacturers Brush Company, Cuyahoga County, Ohio**

**Filed Jan. 6, 1969, Ser. No. 789,302**
**Int. Cl. A46b *13/00***
**U.S. Cl. 15—181** **25 Claims**



A rotary brushing tool adapted for mounting on a drive shaft in brushing machinery and suitable for sweeping or scrubbing large areas; such brushing tool comprising a plurality of similar interlocking annular brush elements joined end to end, one to the other, in coaxial alignment. The brush elements are each formed of unitary first and second members and brush bristle material held in such members by anchoring means. The unitary first member has an axial hub portion and a radial flange, as does the unitary second member, and they are mounted with their flanges adjacent one another to form a channel holding the brush bristle

material therebetween. The end of the hub portion of the first member is shaped to interlock with the end of the hub portion of the second member of another brush element so that brush elements so formed are joined in this manner end to end in interlocking coaxial alignment. The brushing tool so formed is suited for construction from a variety of materials including sheet metal, but is particularly suited for plastic construction. The tool is also suited for a variety of bristle configurations including a configuration characterized by the brush bristles intersecting the brush axis at oblique angles to afford a side-to-side motion during brush rotation.

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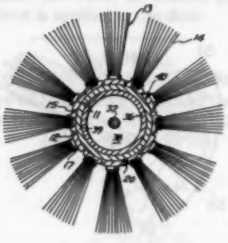
**3,643,282**
**BRISTLE MAT ASSEMBLY FOR BRUSHES**
**Leo Lechene, Patton, and John Campbell, Coalport, both of Pa., assignors to Fab Fibre Company, Patton, Pa.**
**Filed Dec. 2, 1969, Ser. No. 881,530**
**Int. Cl. A46b *1/00***
**U.S. Cl. 15—179** **1 Claim**



A bristle mat assembly for brushes which consists of a mat of rectangular shape, having a fastening device at its opposite ends so that the strip may be formed into a cylinder with its ends interconnected, and a series of spaced rows of longitudinally spaced plastic bristle bundles overlying one side of the strip, with the bristle ends projected through the mat, fused and bonded thereto and extending at right angles thereto; and the method of making same wherein the mat is pressure molded to shape with the bristle bundles assembled into the mold with the bristle ends projected through the mold cavity.

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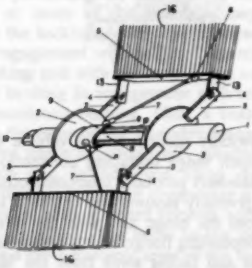
**3,643,283**
**CENTRIFUGAL ROLLER FOR STREET CLEANING DEVICES**
**Fritz Jahnert, Stadtbergen near Augsburg, and Martin Schollhorn, Kissing near Augsburg, both of Germany, assignors to Keller & Knappich GmbH, Augsburg, Germany**
**Filed Aug. 20, 1970, Ser. No. 65,470**
**Claims priority, application Germany, Sept. 30, 1969, P 19 49 304.0**
**Int. Cl. A46b *13/02*; E01h *1/02***
**U.S. Cl. 15—183** **5 Claims**



In a centrifugal roller mounted on street cleaning devices having pivotable broom carriers which pivot parallel with respect to the rotational axis of the roller so that the brooms engage the circumference of the roller at a defined point, there is provided a connecting rod joining each of the broom carriers to a collar which is slidably mounted on a roller so that when the collar is positioned on the roller, the broom carriers can be easily adjusted in order to equalize the wear on the broom bristles during the operation of the street cleaning device.

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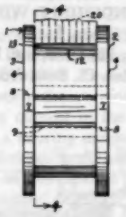
**3,643,284**
**REUSABLE BUFFING WHEEL CARRIER**
**Henry J. Patterson, 468 W. Hudson, Madison Heights, Mich.**
**Filed Aug. 10, 1970, Ser. No. 62,534**
**Int. Cl. B24d *29/00***
**U.S. Cl. 15—230.19** **3 Claims**



Two slidably interfitting duplicate and complementary members, each having an end plate, a hole approximately centrally formed in said end plate to mount the member on an arbor, three webs, each defining one face, equally, angularly spaced about the center of said hole, said faces occupy planes intersecting at substantially the center of the hole; the hole is elongated through the end plate and through said webs with the effect of dividing the webs into three V-shaped units equally spaced about the center of said hole, and each said unit is comprised of two sectional webs having their inner end portions conjoined and diverging outwardly to terminate uniformly in peripheral faces on which buffing wheels may be mounted; an outer marginal edge portion of the plate extends beyond said peripheral faces and buffing wheels may abut against such marginal portion which resists their escape axially of the member; the spacing of the three V-shaped units leaves three equally spaced V-shaped sockets, one between each pair of such units, so that when two complementary members are assembled, the V-shaped units on each member is received in a V-shaped socket on the other member; the aforesaid surfaces forming the outer surfaces of each V-shaped unit, and being so inclined as to define a V of larger dimensions at the juncture of the surfaces with the end plate and a smaller V at the end of such surfaces remote from said end plate, with the effect that the V-shaped sockets are larger at the ends of said units remote from said end plate and smaller at the juncture of the adjacent faces which form such socket, whereby the smaller ends of the V-shaped units are received into the larger ends of the V-shaped sockets, and with the result that upon slidably assembling the two complementary units, the inclined surfaces fully interengage with little or no space therebetween.

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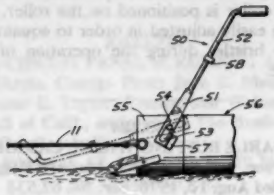
**3,643,285**
**SLUDGE SCOOP FOR OIL TANKERS**
**Henry J. Modrey, Eagle Drive, Stamford, Conn.**
**Filed Sept. 11, 1969, Ser. No. 857,154**
**Int. Cl. B63b *57/00***
**U.S. Cl. 15—246.5** **5 Claims**

This invention is directed to apparatus for removing sludge from the bottom of the tanks of an oil tanker and includes a hoisting winch at the top of the tank with its cable extending

down into the tank and attached to a sludge scoop initially remotely located at the bottom of the tank. An adjustably




positioned snatch block is used to control the lead of the cable and to establish the desired path of travel of the sludge scoop.

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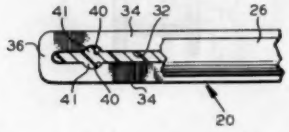
**3,643,286**
**WINDSHIELD WIPER**
**Leo J. Wubbe, Beverly Shore, Ind.**
**Filed Mar. 18, 1970, Ser. No. 20,585**
**Int. Cl. B60s *1/02***
**U.S. Cl. 15—250.38** **7 Claims**




This invention relates to blade elements adapted for use in windshield wiper assemblies for wiping curved windshields. The assembly includes a blade element and a pressure-distributing superstructure operatively connected together so as to transmit and distribute pressure received by the pressure-distributing superstructure from the wiper arm to spaced locations along the length of the blade element to conform the blade element to the shape of the surface of the windshield to be wiped. The blade element comprises a support member and a resilient wiping member whose lowermost portion is adapted to wipe windshields and which is maintained under longitudinal tension by means interlocking the support member and the resilient wiping member.

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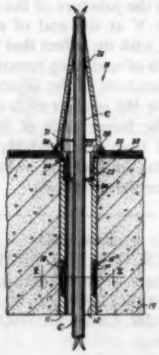
**3,643,287**
**LEAD-THROUGH DEVICE**
**Oliver W. Majors, P.O. Box 1781, Corpus Christi, Tex.**
**Filed Feb. 17, 1969, Ser. No. 799,659**
**Int. Cl. F16l *5/00***
**U.S. Cl. 16—2** **8 Claims**



A lead-through device insertable in holes drilled in a concrete floor and the like for leading cables or wires from below to above the floor of a building structure which protects the cable or wires from contact with the concrete and has a resilient hood which extends above the floor a short distance to protect the wires or cable.

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**ERRATUM**

For Class 16—96 see:
Patent No. 3,643,529

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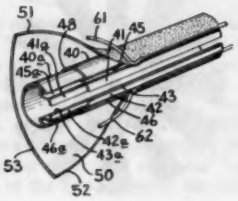
**3,643,288**
**TELESCOPING DRAPERY ROD CONSTRUCTION**
**Humbert Olivari, Randallstown, Md., assignor to Eastern Products Corporation, Columbia, Md.**
**Filed Oct. 13, 1969, Ser. No. 865,740**
**Int. Cl. A47h *1/04***
**U.S. Cl. 16—96** **1 Claim**




A fabric covered drapery rod having inner and outer telescoping rod sections slotted at the back and including registering grooves forming continuous channels for anchoring the fabric along the edges of the slot with the rod extended to desired length. The lateral edges of the fabric are held in the channels by frictional tucking strips.

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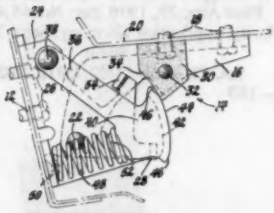
**3,643,289**
**INFINITE POSITION HOLD OPEN HINGE**
**Thomas E. Lohr, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.**
**Filed June 2, 1969, Ser. No. 829,255**
**Int. Cl. E05d *11/08***
**U.S. Cl. 16—142** **4 Claims**



A door is pivotally mounted to a vehicle by an infinite position hold open hinge including conventional male and female hinge members pivotally interconnected. The female hinge member pivotally mounts one end of a lever about an axis inboard from the hinge axis with the other end of the lever having a depending flange with a center arcuate surface generated about and facing away from the hinge axis. The male hinge member mounts a plastic brake having an arcuate surface generated about and facing the hinge axis for engagement with the arcuate surface of the lever. A spring extending between the female hinge member and the other end of

the lever biases the arcuate surface of the lever into frictional engagement with the arcuate surface of the brake. The depending flange also has lead in surfaces providing a smooth transition to the center arcuate surface the female hinge member includes and a stop preventing engagement of the lever the and brake when the door is in closed position to prevent the brake from taking a permanent set. Moving the door from closed position to open position moves the arcuate surface of the lever along the arcuate surface of the brake to produce a frictional drag which wedges the surfaces apart against the action of the spring to decrease the effort of opening the door. Moving the door from open position to closed position moves the arcuate surface of the lever oppositely along the arcuate surface of the brake to produce a frictional drag which wedges the surfaces together aiding the action of the spring to increase the effort of closing the door. When the door is in an intermediate position between the open and closed positions, the engagement between the arcuate surfaces of the lever and brake prevents movement of the door toward either the open or closed positions until a predetermined force is applied to the door.

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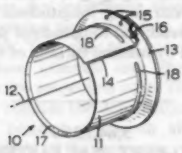
**3,643,290**

## BUSHING AND BUSHING ASSEMBLY

**John D. Milne, c/o 62 Shaft Road, Rexdale, Ontario, Canada**

**Filed Dec. 1, 1969, Ser. No. 881,215**
**Int. Cl. F16l 3/00**
**U.S. Cl. 16—2** **17 Claims**



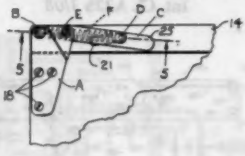

A bushing comprising a cylindrical portion, and a flange portion presented at one end of the cylindrical portion and projecting outwardly from and around the cylindrical portion. The bushing is axially split throughout its length, a plurality of circumferentially spaced openings being formed through the flange portion of the bushing on one side of the split, and one or more locking pins projecting from the flange portion on the other side of the split so that, depending on which of the openings the or each pin is disposed through, the diameter of the bushing which is formed of a resiliently deformable material can be varied. In an alternative embodiment the plurality of openings are formed transverse to the axis of the bushing rather than through the flange portion, and instead of the above-mentioned pin or pins a single circumferentially disposed locking pin is presented by the flange portion on the above-mentioned other side of the axial split, the pin having a tooth which is engageable with the farthest opening from the split through which the pin is disposed thereby again permitting the diameter of the bushing to be varied. Two or more of the bushings may be assembled together with the locking pin or pins presented by one of the bushings in engagement with selected openings provided in the other bushing and with the locking pin or pins presented by said other bushing in engagement with selected openings in the first-mentioned bushing. Thus, a bushing assembly is provided, the diameter of the assembly being variable within a range of sizes which is substantially greater than the range of sizes which can be achieved using only one of the bushings. Furthermore, a game comprising a plurality of the bushings together with a board formed with a plurality of holes may be provided. The holes in the board are of different sizes, and the adjustable sizes of the bushings are such that, in relation to each hole in the board, only one of the bushings has an adjustable size which corresponds to the size of said hole.

**3,643,291**

## COMBINATION HINGE AND CLOSING DEVICE FOR DOORS

**Robert E. Clark, West Columbia, S.C., assignor to Revco, Inc., West Columbia, S.C.**

**Filed Oct. 12, 1970, Ser. No. 79,816**
**Int. Cl. E05f 1/12**
**U.S. Cl. 16—188** **6 Claims**




A pair of hinges carried closely adjacent the sides of a chest freezer and the like, for aiding in closing the door thereon. The hinge includes a mounting bracket, a hinge means extending between the mounting bracket and the door, an elongated slot carried in the side of the door, an elongated linkage arm, a bearing means carried adjacent one end of the elongated linkage arm, and a pivot means connecting the other end of the linkage arm to the mounting bracket. A spring is coupled between the hinge means and the bearing means so that according to the location of the center line of the spring the apparatus either aids in maintaining the door closed, or for heavier doors aids in raising the door.

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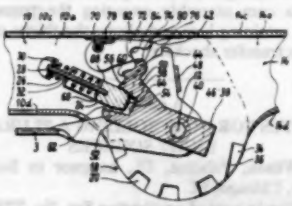
**3,643,292**

## AUTOMATICALLY INTERLOCKABLE HINGE FITTING

**Otto Mayer, Muhlstrasse 76, D-7067 Pluderhausen, Germany**

**Filed Aug. 21, 1969, Ser. No. 851,974**
**Claims priority, application Germany, Aug. 23, 1968, P 17 75 524.7**
**Int. Cl. E05d 11/10**
**U.S. Cl. 16—144** **2 Claims**



A lockable hinge fitting which usually forms part of folding ladders, reclining chairs, etc., in which a pair of hinge arms are connected one to the other turnable round a common axis. One hinge arm carries a spring-loaded locking member which in its operative position locks the hinge fitting in a desired angular position by engaging one of a number of recesses circumferentially spaced apart from each other on the periphery of the other hinge arm. An unlocking lever is provided to move the locking member into its inactive position where the locking member is locked by a pawl. The pawl can be moved into its operative position in which it locks the locking member in its inactive position by pawl-actuating means during the movement of the unlocking lever in its unlocking position. This pawl actuating means is preferably an integral part of the unlocking lever or the pawl. According to the different attachments of the hinge fitting, the pawl will either release the locking member in any subsequent angular

position defined by a recess or only when a suitable pivotable movement of the hinge fitting is performed. In both cases, the interlocking is performed automatically.

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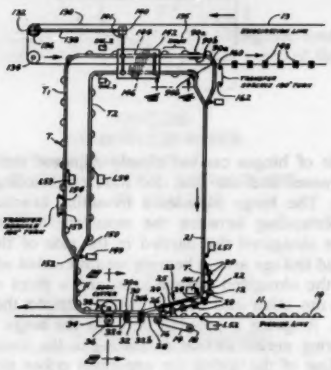
3,643,293

## POULTRY TRANSFER APPARATUS AND METHOD

Jack J. Rejsa, Minneapolis, Minn., and Paul K. Kiker, Ellijay, Ga., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 13, 1970, Ser. No. 81,831
Int. Cl. A22b *3/08*
U.S. Cl. 17—11 8 Claims



Poultry transported by a first conveyor is hung by the feet from shackles. As the birds are moved horizontally at a constant speed by the first conveyor, they are engaged by transfer shackles of a special construction which are supported from a second conveyor. The transfer shackles include a clamp for each thigh composed of a slot and a retaining lug. When the thighs of each bird are forced into the slots, the retainer lug snaps into place over the open end of the slot to prevent the thigh from being released. The birds are then carried by the transfer shackles to a third conveyor which is also provided with leg shackles. The legs of the bird are brought into registry with the shackles of the third conveyor and a cam assembly engaging the transfer shackle releases the retaining lugs and allows the thighs of the bird to fall from the transfer shackles.

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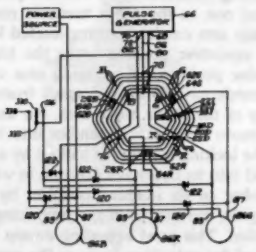
3,643,294

## APPARATUS FOR CONTROLLING A PLURALITY OF LIGHT SOURCES

James F. Wilson, Palatine, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 779,817, Nov. 29, 1968. This application Aug. 10, 1970, Ser. No. 62,593
Int. Cl. H01h *19/58, 21/78;* H04n *9/48*
U.S. Cl. 178—5.4 R 12 Claims



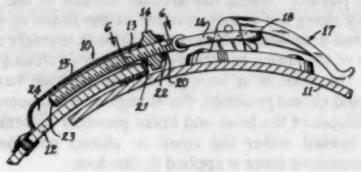
Three variable, addable factors are controlled simultaneously from a single manual setting of the apparatus to produce a resultant having a constant characteristic.

3,643,295

## ADJUSTABLE CLOSURE DEVICE FOR SPORTS SHOES

Robert Schoch, Singen, Hohentwiel, Germany, assignor to Weinmann Aktiengesellschaft, Schaffhausen, Switzerland

Filed June 30, 1969, Ser. No. 837,680
Claims priority, application Germany, July 5, 1968, P 17 60 817.2
Int. Cl. A44b *21/00;* A43c *11/00*
U.S. Cl. 24—70 SK 3 Claims



A stepless adjustable closure device, for sports shoes having two flaps to be releasably closed, has holding means connected to one of the flaps, a threaded arcuate spindle held by the holding means and carries a nut, and the holding means include journal means engaging the spindle on both sides of the nut, thereby restraining longitudinal movement of the spindle with the thread; the longitudinal position of the spindle can be adjusted by manual turning of the nut on the spindle thread.

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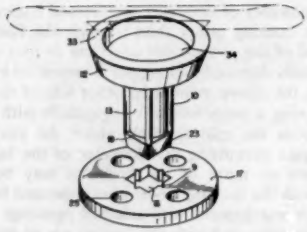
3,643,296

## TWO-PART SNAP FASTENER

Edward Joel Kahn, Baltimore, Md., assignor to Togs, Inc., Baltimore, Md.

Continuation-in-part of application Ser. No. 863,060, Oct. 2, 1969, which is a continuation-in-part of application Ser. No. 819,144, Apr. 25, 1969, which is a continuation-in-part of application Ser. No. 781,296, Oct. 16, 1968, now abandoned. This application Sept. 3, 1970, Ser. No. 69,324
Int. Cl. A44b *1/34, 1/32, 17/00*
U.S. Cl. 24—108 9 Claims



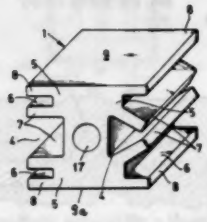
The invention is a two-part snap-fastening device which includes a button member having a stud projecting therefrom, and a foundation member securable to a garment. The projecting stud mates with the foundation member in a semipermanent fashion so that disengagement does not result during normal wearing. The button portion is made of relatively hard material having a stud integral therewith, the free end of which is bulbous and adapted to be inserted into the somewhat resilient foundation member and form a semipermanent connection.

3,643,297

## SLIDE FASTENER

Walter Urban, Egererstrasse 7, Burgthann, Germany

Filed Dec. 11, 1969, Ser. No. 884,176
Claims priority, application Germany, Mar. 29, 1969, P 19 16 228.8
Int. Cl. A44b *19/06*
U.S. Cl. 24—205.13 4 Claims



A link for a slide fastener, the links of which are secured to two binding strips by locking beads along the strip edges in grooves of the links. These grooves are formed on two opposite sides of each link and the two branches defined by each of the grooves are lengthwise slotted parallel to the grooves thereby forming two inner tabs and two outer tabs on each of said sides. The inner tabs are clamped against the beaded strip portion inserted into the grooves thereby locking the links to the respective strip. The outer tabs which are left unchanged conceal the deformation of the inner tabs so that the links present a smooth and ornamental appearance on the outside of the fastener.

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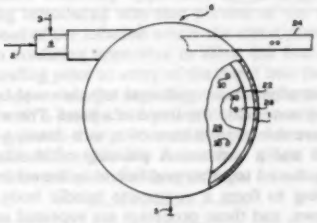
3,643,298

## STEAM CRIMPING OF YARN

Hayes J. Schmick, Morrisville, N.C., assignor to Phillips Fibers Corporation

Filed Sept. 29, 1970, Ser. No. 76,433
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 9 Claims



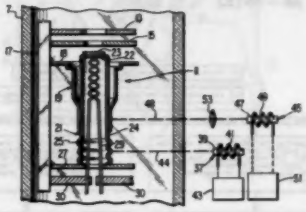
An apparatus and method for uniformly crimping yarn by passing a yarn through a confined crimping zone and providing means in the crimping zone for interrupting the flow of steam streams against opposed sides of the yarn. Each steam stream intermittently contacts the yarn at uniformly spaced portions along the length of the yarn with one steam stream contacting the yarn at a medial location between the contacting locations of the other steam stream. The yarn is thereafter cooled and recovered in a relaxed condition.

3,643,299

## ELECTRON BEAM TUBE AND METHOD OF ADJUSTING THE ELECTRODE SPACING OF AN ELECTRON GUN THEREIN

Martin Kamp Brown, Lancaster, Pa., assignor to RCA Corporation

Filed June 16, 1969, Ser. No. 833,615
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.16 9 Claims



A novel electron beam tube and a method of adjusting the electrode spacing of an electron gun therein utilize an expansion member to support the cathode cylinder of the gun within the electron gun assembly of the tube. With this method, the proper control grid-cathode spacing for cutoff of the electron gun at desired operating voltages is fixed after the tube is constructed and while the gun is operating under normal conditions.

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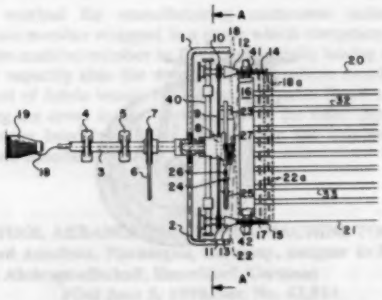
3,643,300

## APPARATUS FOR PRODUCING NONWOVEN SCRIM FABRICS

Pierre Seguin, Chavanoz, France, assignor to Moulinage et Retorderie de Chavanoz, Chavanoz, (Isere), France

Filed Oct. 30, 1970, Ser. No. 85,368
Claims priority, application France, Nov. 7, 1969, 6938635
Int. Cl. D02g *3/00*; D04h *3/08*
U.S. Cl. 28—1 CL 10 Claims

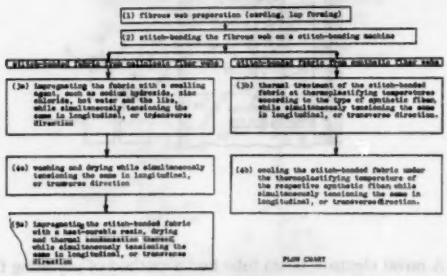


The invention relates to a device for making nonwoven scrim, which device comprises a rotary member distributing two weft threads drawn from two fixedly mounted bobbins. It permits the production of nonwoven scrim of various constructions.

## 3,643,301
## METHOD OF MAKING AN ELASTIC STITCH-BONDED FABRIC

Bedrich Weigl; Milos Janku, both of Dvur Kralove nad Labem; Milos Prikryl, Zabori; Jaroslav Hubeny, Lipnic, and Milos Hofman, Dvur Kralove nad Labem, all of Czechoslovakia, assignors to Vyzkumny Ustav Zuslechtovaci, Dvur Kralove nad Labem, Czechoslovakia

Filed June 10, 1968, Ser. No. 735,748
Claims priority, application Czechoslovakia, June 13, 1967, 4323/67
Int. Cl. D06c *23/04*
U.S. Cl. 28—76 (E) 12 Claims

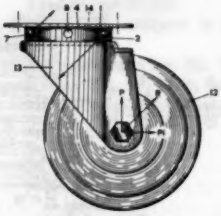

(1) fibrous web preparation (carding, lap forming)
(2) stitch-bonding the fibrous web on a stitch-bonding machine
(3a) impregnating the fabric with a swelling agent, such as sodium hydroxide, zinc chloride, hot water and the like, while simultaneously tensioning the same in longitudinal, or transverse direction
(3b) thermal treatment of the stitch-bonded fabric at thermoplastifying temperatures according to the type of synthetic fiber, while simultaneously tensioning the same in longitudinal, or transverse direction.
(4a) washing and drying while simultaneously tensioning the same in longitudinal, or transverse direction
(4b) cooling the stitch-bonded fabric under the thermoplastifying temperature of the respective synthetic fiber, while simultaneously tensioning the same in longitudinal, or transverse direction.
(5a) impregnating the stitch-bonded fabric with a heat-curable resin, drying and thermal condensation thereof, while simultaneously tensioning the same in longitudinal, or transverse direction
FLOW CHART

A fibrous web is stitch-bonded in an atlas construction which is elastic in two directions whereupon the web is tensioned in one direction thereof. The web contracts and is crimped by the stitches in the respective other direction, and is treated to make the crimp permanent so that the finished fabric is expansible in the crimped direction.

## 3,643,302
## METHOD OF MAKING A ROLLING BEARING ASSEMBLY

Sture Asberg, Lilla Pukevagen 5, Savedalen, Sweden, and Henrikus Jacobus Maria Timmer, Irenelaan 39, Ede, Netherlands

Original application Mar. 17, 1969, Ser. No. 807,545. Divided and this application Dec. 17, 1970, Ser. No. 99,107
Claims priority, application Netherlands, Nov. 14, 1968, 6816232; 6816233
Int. Cl. B23p *11/00*
U.S. Cl. 29—148.4 A 3 Claims

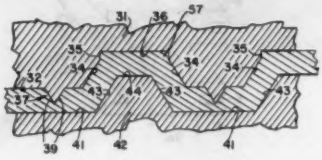


A method for manufacturing a rolling bearing assembly consisting of inner and outer bearing elements having confronting raceways, a plurality of rolling elements in the annular space between the inner and outer bearing elements, each of the bearing elements being associated with a support member and an access opening in one of said bearing elements communicating with the space between said bearing raceways to permit the rolling elements to be positioned into said space, said method consisting of steps of machining each of said bearing elements to form the raceways and thereafter securing each bearing element to its respective support member.

## 3,643,303
## METHOD OF MANUFACTURING TYPE

Joseph S. Kanarek, 5435 West 63rd St., Chicago, Ill.

Filed Sept. 29, 1969, Ser. No. 861,718
Int. Cl. B23p *17/00*
U.S. Cl. 29—413 4 Claims

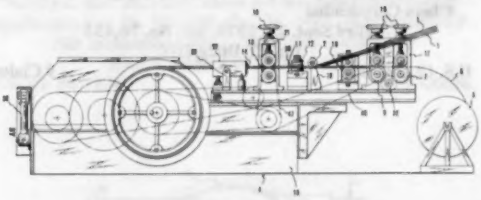



A two-part die set forms type by extruding characters while simultaneously scoring a fracture line around each character. Added height for each character may be provided to maintain its sharpness over an extended period of usage. A holder connected to a heating means carries the type such that it is slidably insertable and removable but effectively retained in operational position therein.

## 3,643,304
## METHOD OF SIMULTANEOUSLY DRAWING A NUMBER OF WIRE MEMBERS

Kaoru Kokubu, and Osami Hirai, both of Osaka, Japan, assignors to Nippon Seisen Co., Ltd., Osaka, Japan

Filed May 15, 1969, Ser. No. 824,827
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 6 Claims



A number of wires are gathered together and bound with an armoring material in the shape of a band. The wires in this condition are drawn by means of a wire-drawing apparatus having dies and a capstan. A plurality of bundles of such wires are gathered together and bound in the same way as in the foregoing to form a composite bundle body, which is further drawn, and these processes are repeated until at last filaments of a specified diameter are obtained in quantities.

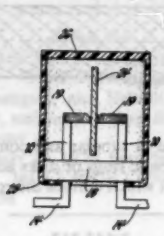
## 3,643,305
## METHOD OF FABRICATING A PIEZOELECTRIC DEVICE

Thomas J. Furnival, Logansport, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 24, 1970, Ser. No. 49,288
Int. Cl. B01j *17/00*; H04r *17/00*
U.S. Cl. 29—25.35 5 Claims

A method of fabricating a piezoelectric device which includes providing a resilient metallic unit, bonding an insulat-

ing base member between two leg members of the unit, severing a bar element of the unit to provide facing projections, and compressively supporting a piezoelectric element therewith prior to permanently bonding it in place.



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**3,643,306**

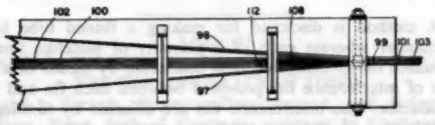
**MACHINE FOR PRODUCING PLASTIC FOAM—SHEET METAL PANELS**

**Daniel Massagli, Covina, and Marino Ralph Massagli, Claremont, both of Calif., assignors to Tru-Lok Metal Fabricating Company, Inc., Los Angeles, Calif.**

**Filed Jan. 6, 1970, Ser. No. 955**

**Int. Cl. B23p *23/04*, *25/00*; B21b *15/00***

**U.S. Cl. 29—33 R** **8 Claims**



A machine and process to continuously produce sandwiched sheet metal rigid plastic foam panels provided with a metal forming unit, an injector for the plastic reactants, and an expansion confining apparatus, the foam-forming reactants being introduced into that portion of the metal panel that is ahead of the location where the metal panel enters the expansion confining apparatus to allow the foam formed to start expanding prior to entry of the panel into the expansion confining apparatus, the expansion confining apparatus being provided with a cavity conforming to the cross-sectional outline of the panel, that portion of the panel remaining in the cavity until full expansion has taken place before it is discharged from the confining apparatus.

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**3,643,307**

**MACHINE TOOL**

**Alfred Ledergerber, and Hans Jacoby, both of Bielefeld, Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp. Aktiengesellschaft, Bielefeld, Germany**

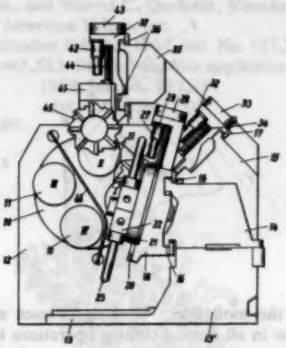
**Filed Feb. 20, 1969, Ser. No. 801,026**

**Claims priority, application Germany, Feb. 23, 1968, P 16 52 728.9**

**Int. Cl. B23b *9/10***

**U.S. Cl. 29—38 B** **9 Claims**

A machine tool with four equidistant work spindles rotatable in a carrier which is indexible about a horizontal axis. Two stations at which the spindles dwell between successive indexing movements of the carrier are accessible from the front side of the frame and each of the remaining two stations accommodates one or more movable tool holders for a variety of tools. All of the stations are located at different levels.



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**3,643,308**

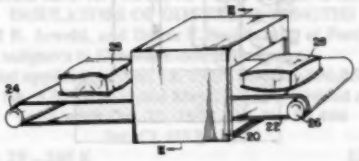
**METHOD FOR MANUFACTURING MATTRESSES**

**Haruhiko Yamamoto, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan**

**Filed June 24, 1970, Ser. No. 49,010**

**Int. Cl. B68g *9/00*; B65b *43/00***

**U.S. Cl. 29—91.1** **4 Claims**



A method for manufacturing mattresses including a cushion member wrapped in a cover which comprises receiving the cushion member in the cover initially having a larger inner capacity than the volume of the cushion member and formed of fabric woven from heat shrinkable fibers and subjecting the cover to heat shrinkage until the inner capacity of the cover becomes slightly smaller than the volume of the cushion member.

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**3,643,309**

**TOOL ARRANGEMENT FOR A MACHINE TOOL**

**Erhard Anschutz, Plochingen, Germany, assignor to Feldmuhle Aktiengesellschaft, Dusseldorf, Germany**

**Filed June 5, 1970, Ser. No. 43,811**

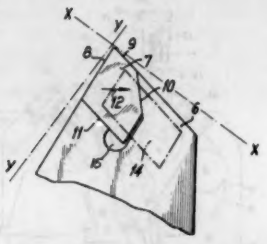
**Claims priority, application Germany, June 18, 1969, P 19 30 916.1**

**Int. Cl. B26d *1/00***

**U.S. Cl. 29—96** **8 Claims**

A ceramic, five-sided cutting plate is clamped in a recess of a toolholder in such a manner that two sides of the plate which constitute cutting edges and enclose an angle of 75° are exposed, the other three sides being located in the recess. The two sides contiguously adjacent the cutting edges are

backed by faces of the toolholder in the recess which jointly define an angle of 37°. The fifth side of the plate which connects the last-mentioned two sides defines an airgap with the




surface of the toolholder. Working stresses applied to the cutting plate in all normal turning operations tend to wedge the plate deeper into the recess of the toolholder, and thus do not cause displacement of the plate.

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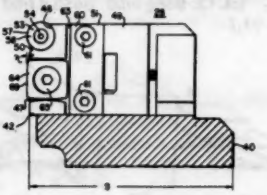
**3,643,310**

**MILLING WHEEL STRUCTURE**

**Ralph Werner Kilbourne, Glenn Mills, and Frank L. Di Ferdinando, West Chester, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Dec. 8, 1969, Ser. No. 883,015**
**Int. Cl. B26d *1/00, 1/12***
**U.S. Cl. 29—105** **6 Claims**



A milling wheel structure for a milling machine comprising a circumferential row of interchangeable cartridges which are nonsymmetrically spaced on the periphery of the wheel. The cartridges receive disposable multiedge cutters, which are rotatable to bring other edges into cutting relation. The cutters are of the finishing or semifinishing type, both of which may be used simultaneously or individually.

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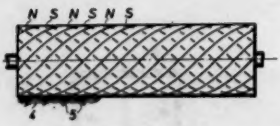
**3,643,311**

**ROTATABLE POWDER DISPENSING CYLINDER FOR AN ELECTROSTATIC POWDER IMAGE FIXING APPARATUS**

**Wilhelm Knechtel, Rodheim; Kurt Brinkmann, Frankfurt am Main-Roedelheim; Hans Krebs, Hinter dem Hain, and Heinrich Mohr, Dortmund-Aplerbeck, all of Germany, assignors to Firma ECE-Elektrostatik und Chemische Entwicklungsgesellschaft mbH, Giessen and Firma Deutsche Edelstahlwerke AG, Krefeld, Germany, part interest to each**

**Filed July 27, 1970, Ser. No. 58,514**
**Claims priority, application Germany, Dec. 11, 1969, P 19 62 106.8**
**Int. Cl. B21b *31/08***
**U.S. Cl. 29—125** **9 Claims**

A rotatable cylindrical member has magnetic poles on its peripheral surface comprising parallel bands of alternating North and South poles with these bands being at an angle of about 45° to the generatrix of the cylinder. The cylindrical




member may be solid or tubular and comprise a plurality of magnetic or nonmagnetic rings or disks adhered together and mounted upon a shaft which defines the rotary axis.

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**3,643,312**

**METHOD OF MAKING FINNED TUBING**

**Charles S. Shriver, Oreland, Pa., assignor to Orbit Manufacturing Company, Perkasie, Pa.**

**Original application Mar. 24, 1969, Ser. No. 809,744, now Patent No. 3,550,680. Divided and this application June 18, 1970, Ser. No. 47,308**
**Int. Cl. B21d *53/02***
**U.S. Cl. 29—157.3 B** **7 Claims**

A method is disclosed for making a finned tube heat exchanger wherein each of a plurality of platelike fins is mounted on an elongated heat conductor by means of a series of interference fits provided between each fin and the conductor. The interference fits are effected by forming a noncircular aperture in the fins, forming a slightly smaller noncircular cross-sectional shape on the conductor, aligning the conductor with the apertures, displacing the conductor longitudinally through the apertures, and, after the fins are properly positioned on the conductor, locking them in place by effecting relative rotation through a portion of a turn to cause a series of interference fits to be established between each fin and the conductor.

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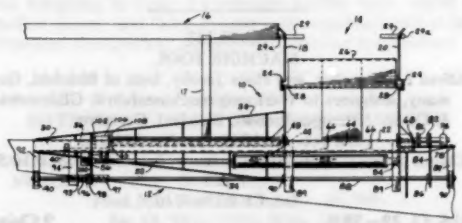
**3,643,313**

**DEVICE FOR REMOVING BANDING MATERIAL FROM A BALE OF CROP MATERIAL**

**Lawrence C. Dickinson, Reno, Nev., assignor to Sperry Rand Corporation, New Holland, Pa.**

**Filed Aug. 25, 1969, Ser. No. 855,796**
**Int. Cl. B23p *19/00***
**U.S. Cl. 29—200 D** **16 Claims**



A device, adaptable for use in combination with a single bale unloading wagon, for cutting and twisting the retaining

band, such as twine or wire, from a bale of crop material by first severing the band with a cam actuated cutting means and then winding the severed band around a pair of twisting bars to remove the band from the bale.

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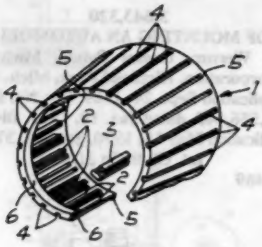
3,643,314

## DEVICE FOR SPACING THE SEGMENTS OF A COMMUTATOR

Anton Worner, Stuttgart, and Helmut Wilbert, Boblingen, both of Germany, assignors to Kaut & Bux oHG, Stuttgart-Vaihingen, Germany

Filed July 22, 1970, Ser. No. 57,160
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 CM 9 Claims



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A cagelike device having an outer tubular wall and a plurality of spacing strips integral with this wall and projecting radially from the inner side thereof for holding the segments of a commutator at the proper distance from each other during the production of the commutator including the step of filling of the commutator with a molding material.

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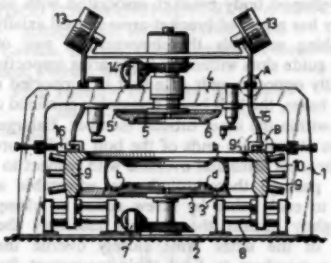
3,643,315

## APPARATUS FOR DRIVING ANTISKID STUDS INTO THE TREAD SURFACE OF TIRES

Friedrich Bartsch, Hannover-Herrenhausen, and Heinrich Blum, Horst, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Jan. 26, 1970, Ser. No. 5,674
Claims priority, application Germany, Jan. 25, 1969, P 19 03 808.5
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 R 15 Claims



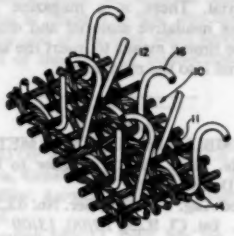
An apparatus for driving antiskid studs into the tread surface of tires, especially pneumatic tires, by means of driving tools, which includes holding means for grasping and holding the tire to be studded and which also includes annular supporting means operable to be placed onto and around the tread surface of the tire to be studded, and equipped with a plurality of driving tools distributed over the circumference of said annular supporting means and operable selectively simultaneously to drive a plurality of studs into the tread surface of the tire to be studded.

3,643,316

## METHOD OF MAKING SEPARABLE FASTENING DEVICES

Laurent H. Girard, Bedford, N.H.; Clive E. Hockmeyer, Lowell, Mass., and Marcel C. Quellette, Manchester, N.H., assignors to American Velcro, Inc.

Original application Feb. 20, 1967, Ser. No. 617,265, now Patent No. 3,461,513. Divided and this application Feb. 24, 1969, Ser. No. 801,357
Int. Cl. B23p *17/00*
U.S. Cl. 29—400 11 Claims



A method of making separable fastening devices which have a very large number of closely spaced hooking elements of the hook and loop type such that pressing opposed surfaces of two fastening members together in face-to-face relation will engage a large number of hooks and loops; the hooking elements are formed of metal and in preferred forms are operable at temperatures from cryogenic temperatures to above 1,000° F.

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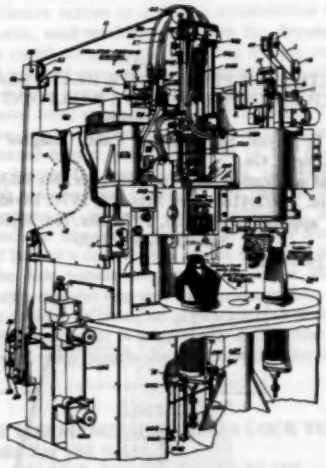
3,643,317

## METHOD AND APPARATUS FOR FORMING SHAPED INSULATORS OF DIFFERENT LENGTHS

Richard B. Arnold, and Dallas F. Smith, both of Fort Wayne, Ind., assignors to General Electric Company

Original application Mar. 11, 1969, Ser. No. 806,057, now Patent No. 3,579,818, dated May 25, 1971. Divided and this application Oct. 27, 1970, Ser. No. 84,406
Int. Cl. H02k *15/10*
U.S. Cl. 29—205 E 13 Claims



Method and apparatus for forming shaped insulators of different lengths from a strip of insulative material. The insulators are automatically formed into the predetermined desired

lengths from a continuous strip of insulative material by apparatus which includes a guide for the strip of insulative material, a driving feed member which advances the strip along the guide and a retaining member which retards movement of the strip. A linkage is coupled to the driving feed member and has a movable pivot to effect a change in the length of strip advanced. A timing means includes a rotatable member connected to the linkage for periodically reciprocating the driving feed member. Control means is connected to selectively effect movement of the pivot to vary the length of stroke of the driving feed member. Severing means is associated with the timing means to sever the advanced strip of insulative material. There is a magazine to receive the severed length of insulative material and shaping means associated with the timing means to insert the severed length of insulative material into the magazine.

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**3,643,318**

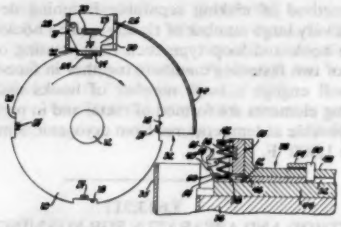
**ASSEMBLY MACHINE AND METHOD**

**Willard I. Roofe, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 10, 1970, Ser. No. 62,279**

**Int. Cl. B23p *19/00, 13/00***

**U.S. Cl. 29—434** **5 Claims**



Machine and method for assembly of workpieces such as primary and secondary weights of a transmission governor. Leading edge of the top flange of the primary weight is used to compress the coil spring seated on the secondary weight. An insert slide wipes the secondary weight and spring off of a carrier to assemble the secondary weight inside of the primary weight and to load the spring internally between the weights.

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**3,643,319**

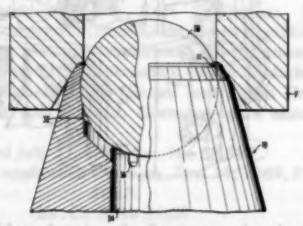
**METHOD OF PRODUCING A HEAT-TREATED BERYLLIUM COPPER TIP FOR A BALLPOINT WRITING INSTRUMENT**

**William B. Payne, San Marino, Calif., assignor to Scripto, Inc., Atlanta, Ga.**

**Original application Nov. 16, 1967, Ser. No. 683,533, now Patent No. 3,502,418, dated Mar. 24, 1970. Divided and this application Mar. 18, 1970, Ser. No. 20,562**

**Int. Cl. B23p *11/00***

**U.S. Cl. 29—441** **5 Claims**



This invention relates to a new improved ball tip for ballpoint writing instruments and a method for producing same. The ball tip of the present invention is made of a heat-treated beryllium copper and incorporates a tungsten carbide ball of a mirror finish. In addition to the conventional steps utilized in producing a ball tip for a ball pen, the method of the present invention incorporates the unique steps of shaping the metal around the ball by a forming tool prior to a spinning operation utilized to free the ball and then subjecting the completed ball tips to an atmospherically controlled heat treatment operation. The ball tip of the present invention renders a greatly improved wear resistant construction having an initially established controlled clearance between the ball and housing thereby rendering an initially intense ink deposit which does not increase to any extent during use due to the wear resistant properties of the housing.

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**3,643,320**

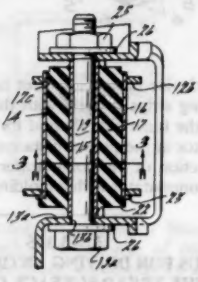
**METHOD OF MOUNTING AN AUTOMOBILE ENGINE**

**Lawrence E. Werner, Grosse Pointe, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**

**Original application Sept. 24, 1969, Ser. No. 860,720, now Patent No. 3,556,445, dated Jan. 19, 1971. Divided and this application May 15, 1970, Ser. No. 37,556**

**Int. Cl. B23p *21/00***

**U.S. Cl. 29—469** **4 Claims**



At each of the forward sides of an automobile engine, a voided bushing assembly comprises an electric bushing radially spacing and bonded to an outer tubular housing member of oval cross section and a coaxial inner tubular support member. The outer member is tightly secured by a forced fit within a pair of closely conforming oval holes in a pair of axially spaced channel sides respectively of a one-piece channel-shaped engine bracket secured to the engine. A one-piece channel-shaped body bracket associated with each bushing assembly has a pair of bracket arms spaced axially to receive the bushing assembly therebetween. A pair of upwardly opening guide slots within the latter arms respectively receive the axially opposite ends of a bolt in supported relationship on their bases, the bolt being releasably confined coaxially by friction within the inner tubular member. Enlarged clamping members at opposite ends of the bolt axially outward of the slotted bracket arms and oversize with respect to the slots to prevent passage therethrough are adjustable axially with respect to each other by screw action to clamp the latter arms tightly against the bushing assembly therebetween. Flanges of the latter arms closely overlie the tightened clamping members to limit their movement from the slot bases, but without interfering with their adjustability.

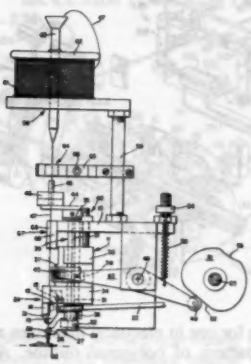
Prior to mounting the engine, the engine brackets with their bushing assemblies are secured to the engine. The bolts are inserted into the inner tubular members and the clamping members are arranged on the bolts so as to clear the flanges of the slotted bracket arms freely. The engine is then lowered into preassembled position by guiding the bushing assemblies between the slotted bracket arms and the bolts downwardly into the slots to their supported positions on the slot bases. The clamping members are then tightened to clamp the adjacent bracket arms against the bushing assemblies.

3,643,321

## METHOD AND APPARATUS FOR TAILLESS WIRE BONDING

Edwin C. Field, Lansdale; Frederick W. Kulicke, Jr., Philadelphia, and Richard W. Masso, Conshohocken, all of Pa., assignors to Kulicke and Soffa Industries, Inc., Fort Washington, Pa.

Filed June 17, 1970, Ser. No. 46,902
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 18 Claims



A tailless wire-bonding apparatus for bonding a fine wire to a semiconductor device and breaking the wire behind the bond without disturbing the bond. A wire threaded through a capillary bonding tool is maintained stiff as the wire is being bonded for a final bond. A wire clamp above the bonding tool is actuated to provide the taut piece of wire between the bond and the wire clamp enabling the bonding tool to be moved toward the wire clamp along the taut wire. Subsequently the wire clamp and bonding tool are moved to break the wire at the reduced cross-sectional area of the bonded wire and to expose a predetermined length of wire out of the end of the bonding tool which may be formed under the bonding tool.

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3,643,322

## METHOD FOR MANUFACTURING A SHOCK ABSORBER RESERVOIR TUBE

De Witt F. Gerstle, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 29, 1970, Ser. No. 50,529
Int. Cl. B23k *1/20, 31/02*
U.S. Cl. 29—482 4 Claims

In preferred form, a method of manufacturing a shock absorber tube from sheet metal comprising the steps of forming a tube section having a longitudinal seam weld along the length thereof; forming a concave die having an inside surface with a central opening therein and a plurality of radial grooves extending from the central opening to the outer peripheral edge of the concave surface; pressing the tube into the die and causing the metal at one end of the tube to form into the inside surface of the concave die to cover ribs between the grooves and to flow into the grooves so as to form spaced, inwardly and outwardly directed reinforcing ribs and a small diameter tapered opening through the formed tube surrounded by a high-density concentration of material; thereafter locating a connector element against the high-density concentration of material and heating and pressing the metal to cause it to flow into the tapered opening for sealing the end of the tube while sinking the connector into the end of the tube for connection to the spaced reinforcing ribs.

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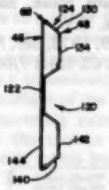
3,643,323

## METHOD OF MAKING A DRAWER FRONT

Everett K. Harris, Geneva; John P. Ericson, St. Charles, and Richard E. Miller, Aurora, all of Ill., assignors to All-Steel Equipment Inc.

Original application July 22, 1968, Ser. No. 746,609, now Patent No. 3,549,301, dated Dec. 22, 1970. Divided and this application Oct. 30, 1969, Ser. No. 871,350
Int. Cl. B21d *39/00;* B23p *11/00*
U.S. Cl. 29—511 2 Claims



The disclosure relates to a drawer construction for office furniture units, such as desks, in which the drawer is made from sheet metal components, including a body member of generally U-shaped transverse cross-sectional configuration defining a drawer bottom and sides, a rear panel, and a special fabricated front made of a stamped or drawn frontpiece and liner secured together by a press-forming operation to form a mitered border along the front of the drawer that avoids machining for smoothness. The sidewalls of the drawer each have secured to same a side panel member that makes the sides of a double-wall construction and hides brackets and the like which secure the drawer front to the drawer and houses a drawer stop device on either side of the drawer. The side panels are shaped to avoid all possible ledges, cracks, and the like that could accumulate dust, and to give the drawer as clean an appearance as possible. Associated with the drawer is a novel clip and divider arrangement that removably mounts the divider within the drawer.

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3,643,324

## MACHINE FOR MANUFACTURING A LOCK TUMBLER

Roy C. Spain, Box 190, Salem, Va.

Filed Feb. 10, 1970, Ser. No. 10,187
Int. Cl. B23p *15/00*
U.S. Cl. 29—566 9 Claims

Machine for manufacturing a lock tumbler comprises means for driving a blank down a passageway past successive

broaches against a punch in a socket at the end of the passageway. The socket is then moved laterally of the

passageway so that the blank therein cont[illegible]third broach and is finally ejected from the socket.

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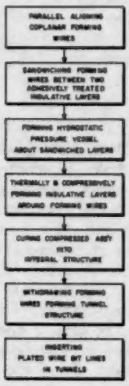
3,643,325

## METHOD OF HYDROSTATICALLY FORMING A TUNNEL STRUCTURE FOR A MAGNETIC PLATED WIRE MEMORY ARRAY

Clyde E. Reed, W. St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 19, 1970, Ser. No. 20,986
Int. Cl. H01f 7/06
U.S. Cl. 29—604 3 Claims


PARALLEL ALIGNING COPLANAR FORMING WIRES
SANDWICHING FORMING WIRES BETWEEN TWO ADHESIVELY TREATED INSULATIVE LAYERS
FORMING HYDROSTATIC PRESSURE VESSEL ABOUT SANDWICHED LAYERS
THERMALLY & COMPRESSIVELY FORMING INSULATIVE LAYERS AROUND FORMING WIRES
CURING COMPRESSED ASSY INTO INTEGRAL STRUCTURE
WITHDRAWING FORMING WIRES FORMING TUNNEL STRUCTURE
INSERTING PLATED WIRE BIT LINES IN TUNNELS

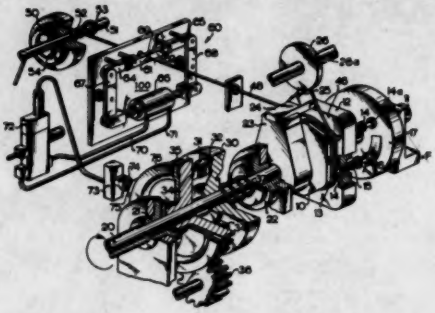
A method of using hydrostatic pressure to form copper word lines and/or a copper ground plane about parallel-aligned forming wires to form a plated wire tunnel structure. The copper word lines and the adhesively coated opposing faces of the plastic films to which they are bonded are firmly and compressively formed about the forming wires with the interstitial portions of such plastic films brought into contact to form one physical structure. After curing, the forming wires are removed from the sandwiched construction forming the tunnels into which respectively associated plated wire memory elements are inserted.

3,643,326

## METHOD FOR MAKING COILS FOR ARMATURES OF ELECTRICAL MACHINES OR THE LIKE

Reinhard Boke; Alfred Schmid, and Heinz Wilke, all of Hildesheim, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 27, 1969, Ser. No. 828,145
Claims priority, application Germany, May 29, 1968, P 17 63 434.3
Int. Cl. H01f 7/06
U.S. Cl. 29—605 3 Claims



Armature coils for use in electrical machines are produced on a revolving pattern of polygonal outline. A continuous length of wire having a current-conducting core surrounded by an insulating sheath is fed under tension to the peripheral surface of the revolving pattern. A set of pushers cooperate with the pattern to move successively formed convolutions axially of the pattern. A cutting device which severs the wire between selected convolutions to form a succession of coils comprises a finger which orbits about the pattern and a reciprocating device which moves the finger axially at predetermined intervals so that the finger loops the wire between selected convolutions and moves the thus engaged part of the wire against a counterknife which is adjacent to the periphery of the pattern. A removing device strips the insulation off those portions of the wire which are to be severed by the cutting device so that the coils are formed with blank terminals.

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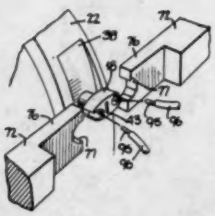
3,643,327

## METHOD OF MAKING A SERIES OF ELECTRICAL CONNECTIONS

David L. Jackson, Doylestown, Pa., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Original application June 26, 1967, Ser. No. 648,795, now Patent No. 3,509,615, dated May 5, 1970. Divided and this application Dec. 17, 1969, Ser. No. 888,095
Int. Cl. H01r 9/00
U.S. Cl. 29—628 R 5 Claims



The connectors are deposited in the rotary wheel at the rear of the machine and fed to the staking station at the front

of the machine. The staking jaws come together to stake the connector on a pair of conductors by crimping the notched ends of the connector over the conductors. The index system indexes the rotary wheel in synchronism with the staking jaws to sequentially advance another connector into the staking station after a connection has been made with a previous connector.

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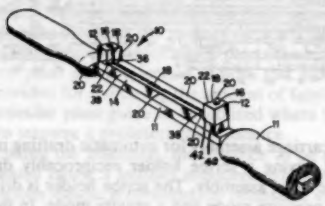
3,643,328

## SKI-RENOVATING TOOL

Albert V. Wainwright, Jr., 35 Lakeshore Drive, Nabnasset, Mass.

Filed Oct. 8, 1969, Ser. No. 864,667
Int. Cl. A63c *11/06*; B27g *17/04*
U.S. Cl. 30—172 7 Claims



A ski-sharpening and surface-renovating unitary tool consisting of a strong, rigid, one-piece handle, having a grip at each end, and having three abrading surfaces, one longer abrading surface being placed just below and at right angles to two shorter abrading surfaces whereby the longer surface and at least one of the smaller surfaces can be simultaneously utilized to renovate the bottom surface of a ski and a metal edge of a ski, respectively. All of the scraping surfaces are of hard metal and the shorter surfaces are both detachably fixed to the longer surface for removal for sharpening.

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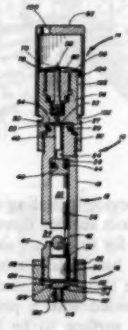
3,643,329

## EXPLOSIVELY ACTUATED CUTTER

Morris S. Lieberman, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 17, 1970, Ser. No. 29,574
Int. Cl. B26b *17/04*
U.S. Cl. 30—180 1 Claim



Apparatus for cutting a hard elongate workpiece having a slideable cutter piston positioned within a cylindrical housing, such piston being actuated by an explosive charge located within the housing, which upon actuation will thrust the piston with great force against an appropriately positioned workpiece thereby cutting the workpiece. A series of gas-sealing elements within the device prevent the discharge of explosive resulting gas and prevent fluid entry.

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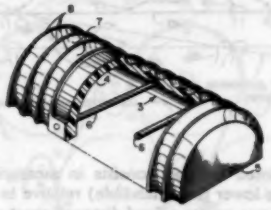
3,643,330

## CUTTERS FOR DRY SHAVERS

Norman J. Brown, Maidenhead, England, assignor to The Gillette Company, Boston, Mass.

Filed July 13, 1970, Ser. No. 54,649
Claims priority, application Great Britain, July 11, 1969, 35,030/69
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 2 Claims



This invention relates to a cutter for a dry shaver having a stationary outer arch shape shear plate and an inner reciprocating cutter that is formed as an integral molding of plastics material having a transversely curved convex surface for engaging the inner surface of the shear plate and presenting a plurality of transversely extending convexly curved cutting edges, at least the convex surface of the plastics molding being coated with a thin layer of metal, the cutting edges being formed by the metal of said layer. This form of cutter is cheaper to produce, lighter and stiffer, and easier to clean than conventional cutters.

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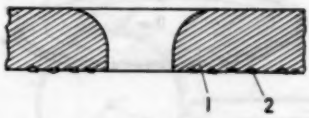
3,643,331

## METAL PLATE HAVING STABILIZED FRICTION PROPERTIES

Bodo Futterer, Handelshof, 6060 Sarnen Obwalden, and Hugo Fritschy, Haus Jasmin 6072 Sachseln, both of Switzerland

Continuation of application Ser. No. 647,659, June 21, 1967, now abandoned. This application June 24, 1970, Ser. No. 56,046
Int. Cl. B26b *21/54*
U.S. Cl. 30—346.54 12 Claims




A shearing foil for a razor constituted by a metal plate having a surface which is in slidable contact with the surface of another foil, and microscopically small solid particles embedded in the plate at least at the contact surface.

3,643,332

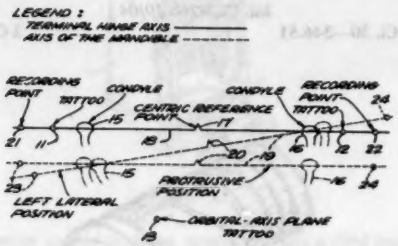
## METHOD AND APPARATUS FOR RECORDING JAW MOVEMENTS

Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif., assignor to Robert L. Lee; Arlene M. Lee and Gene W. Arant, Los Angeles, Calif., part interest to each

Original application Aug. 1, 1966, Ser. No. 569,472, now Patent No. 3,452,439. Divided and this application June 24, 1969, Ser. No. 836,062

Int. Cl. A61c 9/00

U.S. Cl. 32—19 29 Claims




The disclosed method consists in measuring the movements of the lower jaw (mandible) relative to the upper jaw by selecting two points a fixed distance apart on the horizontal axis of rotation of the subject's mandible, one on each side of subject's head and at substantially equal distances from the subject's head; recording the positions of the points relative to the subject's head when the jaws of the subject are in centric relation; and when the subject's mandible moves from centric relation, continuously measuring in three dimensions the position of each of the points relative to the position that it occupied in centric relation.

3,643,333

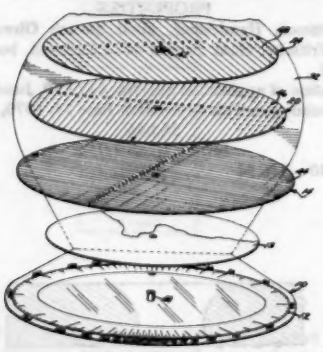
## NAVIGATIONAL COURSE COMPUTER AND PLOTTER

Peter W. Pepper, 8899 Beverly Blvd., Los Angeles, Calif.

Filed Mar. 30, 1970, Ser. No. 23,559

Int. Cl. G01c 21/20

U.S. Cl. 33—1 8 Claims



A navigational course computer and plotter for a boat utilizes a base member that receives a navigational chart and is imprinted with a compass rose. Three transparent discs are mounted for rotation relative to the base member on a common vertical axis. Each of the discs is imprinted with sets of spaced parallel lines. Two of the discs are manipulated to diagram a fix of the boat's location when used with a radio direction finder or the like. The third disc is employed to indicate the course to be followed from the fixed position to a desired destination.

3,643,334

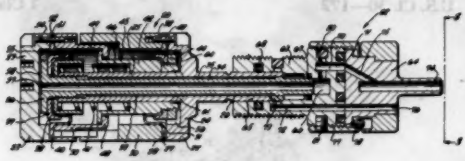
## PEN CARRIAGE ASSEMBLY

John Gelb, Tarzana; Eugene M. Merwin, Northridge, and William B. Richardson, Santa Susanna, all of Calif., assignors to Computer Industries, Inc., Sherman Oaks, Calif.

Filed Nov. 19, 1969, Ser. No. 878,167

Int. Cl. B43l 13/00

U.S. Cl. 33—18 R 11 Claims



A pen carriage assembly for automatic drafting machines is described having a scribe holder reciprocably driven by a pneumatic drive assembly. The scribe holder is driven in two modes, a pressure mode and a gravity mode. In the pressure mode, the pneumatic drive assembly includes a first pressure chamber, the expansion of which forces the movable portion of the assembly downward to move the scribe into writing engagement with the drafting paper. In the gravity mode, the pneumatic drive assembly includes a second pressure chamber, the expansion of which enables the movable portion of the assembly to be released from its support means to drop downwardly due to gravity and also to move the scribe into writing engagement with the drafting paper.

3,643,335

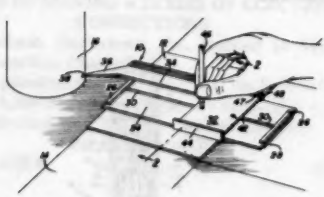
## TILE-MARKING DEVICE

Elmer L. Smith, 14079 Dumbarton Drive, Brock Hall Estates, Upper Marlboro, Md.

Filed Oct. 17, 1969, Ser. No. 867,196

Int. Cl. B43l 13/02

U.S. Cl. 33—42 5 Claims



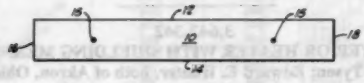
A tile-marking device including a baseplate having bosses on the top and bottom surface thereof spaced apart 9 and 12 inches respectively for reversible use with 9 and 12 inch tiles respectively. The baseplate includes a longitudinal slot thereon and a slide member is reciprocally mounted on the baseplate and provided with a projecting finger which engages an irregular surface to be followed with the sliding member including central holes spaced 9 and 12 inches respectively from the tip end of the finger so that the baseplate may be placed on a tile overlying a previously laid tile and the finger engaged with an irregular surface to duplicate the irregularity of the surface to be cut or edge to be formed into the tile.

3,643,336

## METHOD AND APPARATUS FOR PLEATING FABRIC

Jennie Henry, 425 West Douglas Drive, Midwest City, Okla.

Filed Aug. 18, 1969, Ser. No. 850,754
Int. Cl. G01b 3/00
U.S. Cl. 33—174 G 5 Claims



Apparatus for placing pleats in a fabric including an elongated measuring device having longitudinally spaced holes formed therethrough, and a plurality of pleat guides each having two substantially parallel edges and a transverse bend line extending between and normal to these edges to form a retainer flap for retaining the respective pleat guide adjacent an edge of the fabric at which pinch pleats are to be formed. A table of pleat guide selection indicia and fabric amount data is provided for indicating the amount of fabric required, and a particular pleat guide to be utilized where the pleated fabric is to traverse a predetermined distance.

In practicing the invention, the distance to be transversed by the pleated fabric is initially measured. The table of pleat guide selection indicia is consulted to determine which of the several pleat guides should be utilized for the particular measured distance of traverse. The table also indicates the amount of fabric required to span this distance after a series of pleats are sewn therein. The measuring device is used to indicate, the locations along a marginal edge of the fabric where bisector fold lines of the pleats are to be formed. Finally, the selected pleat guide is placed on the fabric with one of the parallel edges extending through one of the marks. The other parallel edge is used to determine the seam line of a pleat to be formed at the location of the mark. This use of the selected pleat guide is repeated for each of the marks to form all of the pleats.

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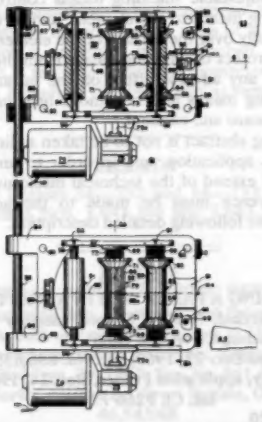
3,643,337

## AUTOMOBILE FRONT END ALIGNMENT EQUIPMENT

Roy E. Dick, 3758 Blue Rock Road, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 386,460, May 19, 1964. This application Aug. 5, 1968, Ser. No. 757,190
Int. Cl. G01b 7/30
U.S. Cl. 33—203.13 8 Claims



Automobile front end alignment equipment in which a platform comprised of a pair of trucks correlated for like orientation while free for universal movement on a horizontal surface, supports respective carriages for free swinging about respective vertical axes, which carriages engagingly support front wheels of a vehicle in predetermined relation to the wheels of a vehicle, and a bracket attachable to a wheel whereby correlated toe-in toe-out and camber of wheels may be simultaneously measured.

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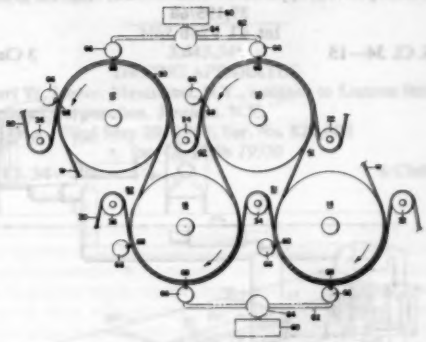
3,643,338

## DRYING SYSTEM FOR A PAPERMAKING MACHINE

Albert Edward Harold Fair, 101 Monmouth St., Brookline, Mass.

Filed July 9, 1970, Ser. No. 53,593
Int. Cl. F26b 3/00
U.S. Cl. 34—6 6 Claims



Drying of paper is accomplished by heated, dry air of relatively higher temperature than normally used in paper dryers which is directed under pressure through a restricted orifice across the paper machine width onto and through a porous woven felt and onto and against the wet paper web entrained between the felt and the periphery of a heated dryer drum, thereby creating high, locally induced vapor pressures for inducing a rapid release of the generated vapors. The web is held tightly between the felt and the face of the dryer drum thereby restricting the usual lateral contraction of the web, which contraction results in loss of web width and formation of cockles, streaks and general unevenness in the dried web.

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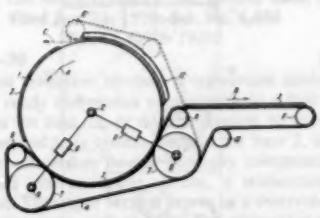
3,643,339

## LEATHER DRYING

Bohuslav Plechac, Otrokovice; Miroslav Ambroz, Gottwaldov-Malenovice, and Josef Mudrik, Lhota u Malenovic, all of Czechoslovakia, assignors to Statni vyzkumny ustav kozedelny, Gottwaldov, Czechoslovakia

Filed Apr. 22, 1970, Ser. No. 30,684
Claims priority, application Czechoslovakia, Apr. 28, 1969, 2990/69
Int. Cl. F26b 3/00, 5/14
U.S. Cl. 34—9 6 Claims



Wet or moisture-saturated leather is placed on a surface of a heated drying cylinder with its grain arranged in a stretched

and smooth condition and its longitudinal axis as defined by the rear edge of the leather piece parallel with the axis of the drying cylinder and with its fresh side out. In this condition the leather piece is then passed between the roller surface and a flexible conveyor band stretched as sling about a portion of the outer periphery of the drying roller, completely across its longitudinal length, until it is dried.

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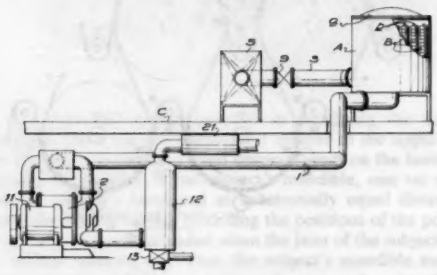
**3,643,340**

## METHODS OF DRYING YARNS AND APPARATUS THEREFOR

**Stewart C. Jackson, Congleton, and Arthur Harrison, Leek, both of England, assignors to William Tatton & Co. Limited, Leek, England**

**Filed Aug. 11, 1969, Ser. No. 848,782**
**Claims priority, application Great Britain, Aug. 16, 1968, 39,195/68**
**Int. Cl. F26b *5/04***
**U.S. Cl. 34—15** **3 Claims**



A process for the drying of yarn on packages in a kier in which air is drawn through the kier by a vacuum pump to lower the boiling point of the water in the packages in order to "flash off" the moisture to promote quicker and more efficient drying of the packages and apparatus for carrying out the process.

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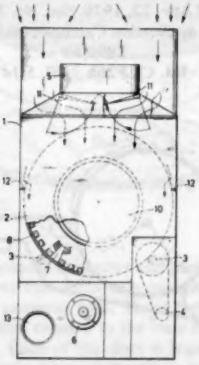
**3,643,341**

## APPARATUS AND PROCESS FOR DRYING SKINS, PELTS, HIDES, FURS, SOFT LEATHERS, AND THE LIKE

**Berthold Magin, Bietigheim, Wuerttemberg, Germany, assignor to Hans F. Arendt, Maschinenbau, Bleichinsel, Bietigheim, Germany**

**Filed Apr. 1, 1970, Ser. No. 24,480**
**Claims priority, application Germany, Apr. 2, 1969, P 19 16 916.5**
**Int. Cl. F26b *3/00***
**U.S. Cl. 34—31** **9 Claims**



This disclosure teaches a dryer and related process for skins, pelts, hides, furs, soft leathers, and like materials, the dryer comprising a perforated drum mounted for reversible rotation in a housing through which heated air is circulated. The drum is lined with thermally nonconductive material (preferably hard wood) and has radial baffles to promote tumbling. The air is heated to a temperature exceeding 100° C. and preferably to a temperature from about 110° to about 160° C. for from about 10 minutes to about 240 minutes.

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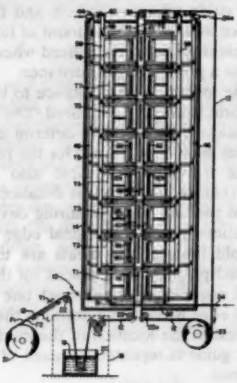
**3,643,342**

## DRYER OR HEATER WITH SHIELDING MEANS

**David Z. Tyson; Edward E. Hunter, both of Akron, Ohio, and Willie Herman Best, Columbia, S.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Original application May 2, 1969, Ser. No. 821,413, now Patent No. 3,590,495. Divided and this application Aug. 17, 1970, Ser. No. 64,488**
**Int. Cl. F26b *19/00***
**U.S. Cl. 34—48** **10 Claims**



Apparatus for drying or heating a continuous length element, and more particularly a drying apparatus in a machine for impregnating such fiber with a liquid fiber-to-rubber adhesive coating in the manufacture of tires, belting and similar products, wherein the element is rapidly dried at a controlled temperature by flame generated infrared-type heating means while (1) an adjustable shielding means controls heat flow from the heating means to the element, and/or (2) moving a gas stream rapidly over the surface of the element and shielding means to protect the heating means from the flowing gas stream against any adverse effect on the infrared radiation from the heating means and to remove heat products from the shielding means and element.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extend of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

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**3,643,343**

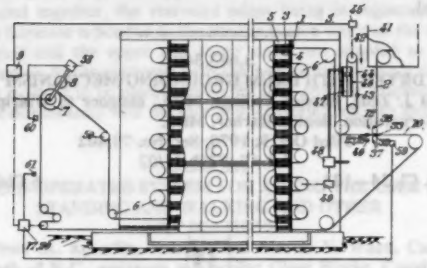
## THREADING A PAPER WEB IN A WEB DRYER

**Paul Henri Marchal, Neuilly, France, assignor to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Dec. 22, 1969, Ser. No. 886,835**
**Claims priority, application France, Dec. 24, 1968, 180506**
**Int. Cl. F26b *13/06***
**U.S. Cl. 34—120** **11 Claims**

This disclosure pertains to a multipass web-treating apparatus particularly adapted for drying a paper web. The web is transferred between passes or zones by turning rolls. A threading device associated with the dryer utilizes turning sheaves which are associated with each turning roll over

which at least one threading rope or tape travels. A clutch is arranged to operatively associate each turning roll and turning sheave to transmit rotary motion from the sheave to the



roll such that the peripheral speed of the roll is equal to or greater than the linear speed of the threading rope or tape. An attachment device is fixed to the tape to hook or unhook the end of a paper web to be threaded through the dryer.

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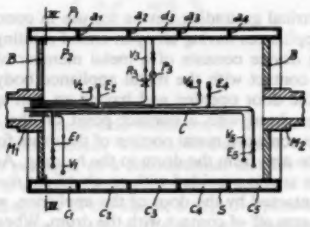
3,643,344

## DRYING CYLINDERS

Henri Robert Strube, Paris, France, assignor to Societe de Recherches et de Realisations Industrielles S.R.R.I. (Societe Anonyme), Paris, France

Filed July 17, 1968, Ser. No. 745,521
Int. Cl. F26b *11/02*
U.S. Cl. 34—124 7 Claims



This invention relates to improvements in drying cylinders for papermaking machines which comprise two concentric cylindrical casings, the confronting walls of which provide a chamber which is separated into individual compartments each of which is fed with controlled quantities of steam, the cylinder also including an evacuation system for the condensed liquid.

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## ERRATA

For Classes 34—202 and 34—133 see:
Patent Nos. 3,643,346 and 3,643,349

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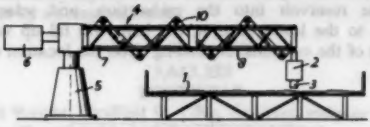
3,643,345

## TERRAIN MODEL VIEWING DEVICE

Raymond Charles Wilton, Worthing, and Peter James Astley, Pulborough, both of England, assignors to Miles Electronics Limited, Shoreham-by-Sea, Middlesex, England

Filed Sept. 29, 1969, Ser. No. 861,669
Claims priority, application Great Britain, Oct. 1, 1968, 46,543/68
Int. Cl. B64g *7/00*; G09b *9/08*
U.S. Cl. 35—12 N 5 Claims

A terrain model viewing device for an aircraft flight simulator comprises an articulated arm mounting a camera at its free end and having its other end pivotally mounted on a base to one side of the model in the case where the model is



horizontal or above or below the model in the case where the model is vertical.

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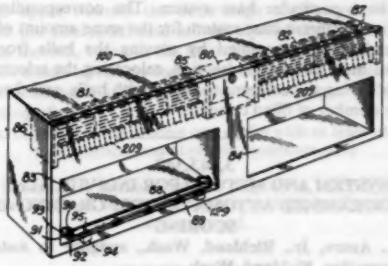
3,643,346

## DRYING APPARATUS

Robert W. Lester, Manhasset, N.Y., assignor to Lestron International Corporation, Jamacia, N.Y.

Filed May 29, 1969, Ser. No. 829,005
Int. Cl. F26b *19/00*
U.S. Cl. 34—202 6 Claims



An improved electric hand dryer which provides a partially enclosed chamber within its housing so that the user's hands can be inserted into the chamber during the drying cycle. Warm dry air is directed in a circular flow path within the chamber so that a major portion of it is recirculated through the heater and dryer while it dries the user's hands on all sides so that the drying cycle and the power requirements of the apparatus are significantly reduced. The dryer can also be adapted for use as a face dryer, food warmer, hair dryer, and as a room heater, and as a clothes dryer.

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3,643,347

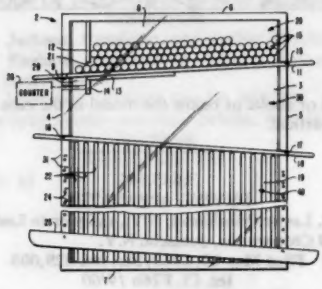
## NUMERAL BASE CONVERSION INSTRUCTIONAL DEVICE

Sigi Ziering, 720 North Walden Drive, Beverly Hills, Calif.

Filed Jan. 21, 1970, Ser. No. 4,484
Int. Cl. G09b *19/02*
U.S. Cl. 35—30 3 Claims

The instant invention involves a conversion device which enables the ready conversion of numerals in a first numeral base, such as the base 10, or decimal system, to another and different, numeral base system, such as the base 2, or binary system. The conversion device generally comprises a container divided into an upper section, a midsection and a lower section. The upper section serves as a reservoir for discrete measuring units, such as balls. The midsection serves as an area of transfer for the balls between the reservoir and the lower section. The lower section consists of a plurality of parallel channels, each adapted to receive a preselected

number of balls. A selector bar, moveable along the lower section, has means for defining the number of balls which can be contained in each column. The device is operated by a gravity feed. If a predetermined number of balls is released from the reservoir into the midsection, and selectively directed to the lower section, the balls will fill up varying numbers of the columns, depending upon the location of the



selector bar. By observing this number of columns filled up by the balls, one can readily determine the corresponding numeral in a particular base system. The corresponding numeral in a different base system for the same amount of balls can readily be determined by moving the balls from the columns back into the midsection, relocating the selector bar again allowing the columns to fill up with balls, and then noting the number of filled columns.

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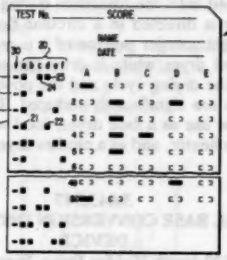
**3,643,348**

## SYSTEM AND METHOD FOR INDIVIDUALLY PROGRAMMED AUTOMATIC TEST GRADING AND SCORING

**Leo L. Azure, Jr., Richland, Wash., assignor to Automata Corporation, Richland, Wash.**

**Filed Aug. 18, 1969, Ser. No. 850,856**
**Int. Cl. G09b *7/00***
**U.S. Cl. 35—48 B** **24 Claims**



Test cards include a group of answer indication areas corresponding to the multiple choice answers for each of a plurality of problems for receiving indicia indicating answer responses to the problems. Correct answer information coded on the card identifies predetermined answer indication areas as corresponding to the correct answers for each problem. Sensing of the correct answer code from each test card automatically programs the apparatus with the correct answer for the problems for comparison with the sensed answer response indicia for grading and scoring the answer responses to the plurality of problems of each test card. A visible correct answer code of plural bit positions includes a number of code bit permutations for identification of each of the answer indication areas as a correct answer to prevent deciphering of the correct answer code. Automatic system control and recording of grading and scoring results is provided.

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**3,643,349**

## DRYER WITH DRUM GROUNDING MECHANISM

**Fred J. Zenz, Berrien Springs, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Oct. 9, 1970, Ser. No. 79,402**
**Int. Cl. F26b *11/02***
**U.S. Cl. 34—133** **6 Claims**

An electrical grounding device for use in connection with laundry appliances having an open-ended rotating drum. The grounding device consists of a metal member affixed to an electrical contact with the metal appliance body or cabinet adjacent the door opening and having an arm spring-biased toward the drum with a contact point on the end thereof adapted to contact a metal portion of the drum for grounding through the arm from the drum to the housing. An offset portion of the arm is provided with an abutment member which will be contacted by the door of the appliance, when closed, to lift the arm off of contact with the drum. When the door is open, the abutment member will be released and the spring bias of the arm will create mechanical and electrical contact with the drum.

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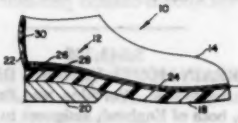
**3,643,350**

## LAMINATED SHOEHORN

**Rocco E. Paoletta, Boston, and William Petrou, Haverhill, both of Mass., assignors to Perma Horn Sales Corporation, Haverhill, Mass.**

**Filed July 27, 1970, Ser. No. 58,402**
**Int. Cl. A43b *00/00***
**U.S. Cl. 36—2.5 Y** **8 Claims**



A laminate having upper and lower strata is provided for incorporation into a shoe as an integral part thereof. The lower stratum includes a tab portion having flocking on one face for cushionable engagement with the heel of a person's foot and a glazelike surface on the opposite face for slidable

engagement with the counter of the shoe. The profiles of the rearward edge of the lower stratum with the exception of the tab portion and the rearward edge of the upper stratum substantially conform to the profile of the rearward edge of the shoe sock lining. The upper stratum and lower stratum are bonded together, the rearward edges being in registration. The laminate is bonded to the shoe in such a way that the tab portion and the upper and lower strata are adapted to be pulled up for engagement with the heel of the person's foot as it is about to be placed within the shoe and are adapted to slide downwardly with the foot as it is inserted into the shoe.

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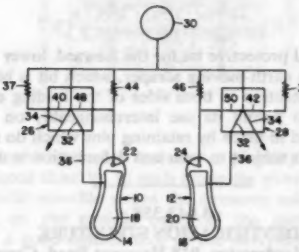
**3,643,351**

**FLUID-OPERATED SYSTEM FOR AIDING THE USER IN STANDING AND WALKING AND OTHER APPLICATIONS**

**Herbert M. Eckerlin, Raleigh, and Morris V. Ward, Cary, both of N.C., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Mar. 3, 1969, Ser. No. 803,757**
**Int. Cl. A43b *00/00***
**U.S. Cl. 36—2.5** **7 Claims**



A pair of shoes, hand-held members, or the like having one or more cavities therein which communicate with one or more output passages of a conventional bistable fluidic element. Fluid is supplied to the element to activate the suction forming capabilities of the shoes, a negative pressure or partial vacuum being drawn on the passages whenever one or both of the passages are in a passive condition with respect to fluid flow therein. The shoes or hand-held members adhere to a floor or other surface of contact when the soles or cavity defining parts are placed in conforming contact with the floor or surface.

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**3,643,352**

**OVERSHOE FOR GOLF**

**Raymond K. S. Adair, 104-2040 York Street, Vancouver, British Columbia, Canada**

**Filed Oct. 2, 1970, Ser. No. 77,554**
**Int. Cl. A43b *1/10***
**U.S. Cl. 36—7.3** **11 Claims**

The specification discloses an overshoe for use in playing golf and other sports. The overshoe is of the flexible resilient kind which is stretched over an ordinary shoe and it has a plurality of cleats to give good footing. The cleats are located within holes in the outer sole of the shoe and have threaded stems which are engaged within threaded openings in washers located on the inside of the overshoe. The washers are overlain by separate heel and sole pads which are in turn overlain by a complete insole.

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**3,643,353**

**FOOTWEAR**

**Donald Weight, Chalfont St. Giles, England, assignor to Monsanto Chemicals Limited, London, England**

**Filed Apr. 3, 1970, Ser. No. 25,555**
**Claims priority, application Great Britain, Apr. 25, 1969, 21,332/69**
**Int. Cl. A43b *13/38***
**U.S. Cl. 36—44** **18 Claims**

An improved article of footwear comprising a heelboard and an upper wherein the outer edge of the upper is bent around the heelboard and adhesively bonded to the lower surface thereof, wherein the improvement comprises a sheet of resin which covers at least a portion of the lower surface of the heelboard, said resin being selected from the group consisting of:

A. copolymers of at least one olefin with at least one nonhydrocarbon aliphatic monomer, and

B. blends of A with at least one polyolefin, whereby the adhesive bond between the upper and the heelboard is strengthened.

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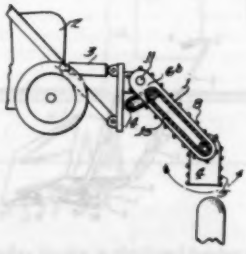
**3,643,354**

**APPARATUS FOR ROOTED PLANT EXCAVATING**

**Samuel E. Clegg, 729 Bartlett Avenue, Plainfield, Ill.**

**Filed Jan. 13, 1969, Ser. No. 790,540**
**Int. Cl. A01g *23/04***
**U.S. Cl. 37—2 R** **23 Claims**



An excavating apparatus for digging a plant and root ball. In one embodiment the apparatus is adapted for attachment to a power source, and has a curvilinear cutting arm rotatable with respect to a positionable support frame and a digging member attached to the frame to dig a hole to allow a portion of the frame to descend into the ground with the curvilinear cutting arm. The method of excavating a rooted

plant by digging a curvilinear channel vertically into the ground adjacent the plant to be excavated, arcuately under the rooted plant to a point directly below the plant, retracing the path of the channel to remove the digging apparatus from the ground, digging a curvilinear channel vertically into the ground adjacent the plant opposite the first channel, arcuately under the rooted plant to a point directly below the plant, and lifting the undercut plant and its protective soil ball from the ground.

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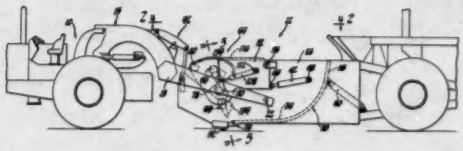
**3,643,355**

**SELF-LOADING SCRAPER WITH CLEANING SHIELD FOR THE BLADES**

William H. Eiger, Eastlake, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1969, Ser. No. 879,657
Int. Cl. B60p 1/00, 1/36
U.S. Cl. 37—4 1 Claim



A self-loading earthmoving scraper having a scraper bowl provided with a loading device carried by the front end of the bowl above the scraper blade. The loading device has a plurality of paddles supported for orbital movement about a transverse horizontal axis and is adapted to be driven in a direction to load material cut by the scraper blade into the bowl. Each of the paddles is provided with outwardly projecting means formed on the rear surface of the paddle that cooperate with the ejector for discharging material out of a bowl.

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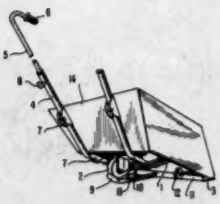
**3,643,356**

**HAND-OPERATED SNOW REMOVING TOOL**

Helmut Gohl, Sulzbach Murr, Germany, assignor to Fahrzeuge und Gerate GmbH & Co. KG, Hannover-Ricklinger, Germany

Filed Sept. 22, 1969, Ser. No. 859,718
Claims priority, application Germany, Sept. 25, 1968, P 17 84 843.0
Int. Cl. E01h 5/02
U.S. Cl. 37—53 5 Claims



A tool in the nature of a snow shovel comprising a box-shaped container having an open top and front side, a pair of adjustable handle bars projecting upwardly from the rear end of the container and at an oblique angle to the bottom of the container, a slide rail removably secured to the front part of said bottom and projecting slightly beyond the front edge of the bottom, and a runner rotatably and pivotably mounted on the lower side of the bottom at a point underneath the center of gravity of the entire tool.

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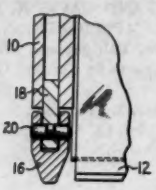
**3,643,357**

**ROUTER BIT FOR SCRAPER BOWL**

Gregory M. Benning, Joliet, and Dennis E. Shipp, Centralia, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 25, 1969, Ser. No. 844,966
Int. Cl. E02f 9/00
U.S. Cl. 37—141 3 Claims




A hard metal protective bit for the forward, lower edges of the bowl of an earth-moving scraper, which bit is bifurcated to provide protection to both sides of the leading edge and bisymmetric to permit its use interchangeably on the two edges. It is held in place by retaining pins which do not have projecting parts subject to wear and deformation in use.

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**3,643,358**

**IDENTIFICATION STRUCTURE**

Lawrence D. Morderosian, 918 Harcourt Road, Grosse Pointe Park, Mich.

Continuation of application Ser. No. 517,695, Dec. 30, 1965, now abandoned. This application July 25, 1968, Ser. No. 751,678
Int. Cl. G09f 3/02
U.S. Cl. 40—2.2 4 Claims

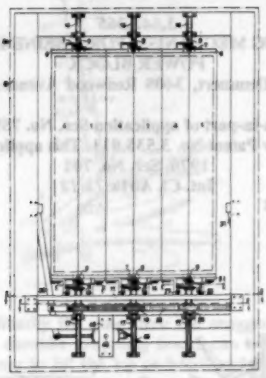
An identifying system for objects made from metal utilizing indicia selected from material having a substantially different radiation absorption coefficient and melting temperatures higher than the melting point of the object to permit identification by radiographic techniques.

3,643,359

## ADVERTISING BOARD

Witold Nowicki, 3 rue La Condamine, 75, Paris, France

Filed Jan. 22, 1970, Ser. No. 7,484
Claims priority, application Germany, Jan. 30, 1969, P 79 04 533.1
Int. Cl. G09f 11/02
U.S. Cl. 40—35 5 Claims



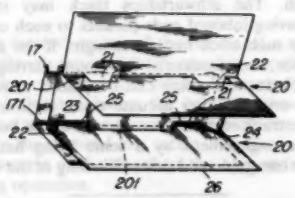
An advertising board includes a plurality of groups of plates placed close by. In each group the plates are set up in a semicircle movable round the common axles. The plates standing on the straight edges of the semicircles, form together a good sight-surface of the advertising board. The number of plates in each group equals the number of different plate positionings and different sight-surfaces. The mechanism that changes position of the plates consists of a revolving and steering system.

3,643,360

## LOOSE-LEAF FILING INDEX AND METHOD OF MAKING IT

Kurt C. Vogl, Clay, N.Y., assignor to Boorum & Pease Company, Brooklyn, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,359
Int. Cl. G09f 7/00
U.S. Cl. 40—104.19 11 Claims



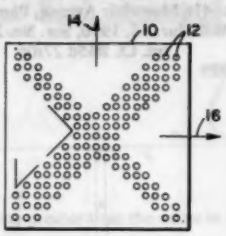

The index is a composite sheet or panel with pockets for filing cards on both its faces. The index and its pockets are made by nesting a plurality of folded sheets which have tabs offset along one side of the foldline. When nested, the tabs depend below the foldline and space the folded sheets apart and form individual pockets on each face of the index, for filing cards with a margin visible.

3,643,361

## MOIRE MOTION ILLUSION APPARATUS

Robert B. Eaves, Wayne, Pa., assignor to Photo-Motion Corporation, King of Prussia, Pa.

Filed Nov. 17, 1969, Ser. No. 877,298
Int. Cl. G09f 13/34
U.S. Cl. 40—106.53 12 Claims



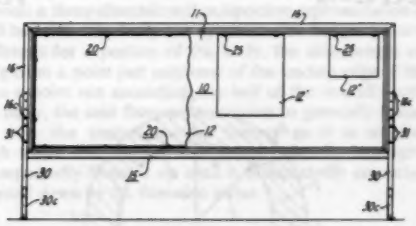

Apparatus and methods are presented for the simulation of motion through the use of moire patterning. Motion simulation is accomplished with two overlay transparent sheets imprinted with dot patterns of different frequencies. One of the sheets, having a plurality of dot patterns of different frequencies, is held stationary and the other sheet, having a uniform dot pattern, is moved relative to the stationary sheet, and an illusion of motion is created on the stationary sheet by movement of moire patterns resulting from the interaction of the dot patterns on the two sheets. Depth illusion may also be accomplished through the use of dot patterns of different frequencies on the front and back surfaces of the stationary sheet.

3,643,362

## SIGN DISPLAY DEVICE

Robert H. Hackett, Oakmont; Charles D. Hartmann, Pittsburgh, and Brady M. Elias, Jeannette, all of Pa., assignors to I.D.L. Incorporated, Pittsburgh, Pa., by said Hackett and H.J. Heinz Company, Pittsburgh, Pa., by said Hartmann and said Elias

Filed Dec. 8, 1969, Ser. No. 883,160
Int. Cl. G09f 1/12
U.S. Cl. 40—156 15 Claims



A signlike display device is disclosed having a substantially flat backup board member, a frame about and enclosing the outer peripheral edge portions of the board member, and support assemblies at each end of the frame in the form of a pair of members, each having an upright leg and a horizontally outwardly projecting foot and being removably and adjustably secured to vertical end members of the frame and adaptable for different heights of support and for different spacing of members. The frame, of integral construction, has an outer, reinforced part of hollow boxlike section and an

inner part of dual channellike section whose back portion is adapted to slidably closely receive edge portions of the board and whose forward open mouth portion is adapted to bypass the board and to removably receive mounting means in the form of clamping elements for positioning paperlike sheets of advertising material on wide side faces of the board member.

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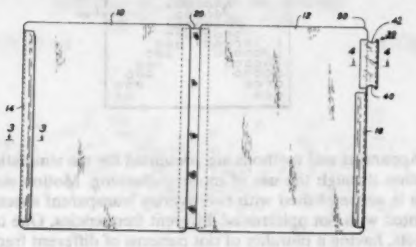
**3,643,363**
**REUSABLE FILE FOLDER**
**F. Joseph Biro, 416 Montclair Avenue, Pompton Lakes, N.J.**
**Filed Mar. 18, 1970, Ser. No. 20,672**
**Int. Cl. B65d *27/06***
**U.S. Cl. 40—359** **9 Claims**



A file folder is made with both front and back covers of sheet plastic, joined by a flexible material such as cloth. These cover members have their longitudinal side margins integrally formed into clips disposed to releasably retain sheets of paper and the like. One of the covers preferably has an index tab retainer attached or formed from the cover so as to extend outwardly from the cover, said tab retainer adapted for inserting or attaching new indexing strips when desired.

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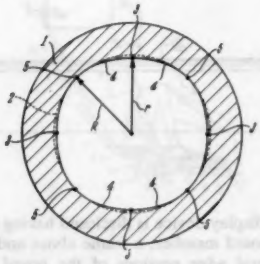
**3,643,364**
**RIFLED GUN BARREL WITH THE INTERIOR CROSS-SECTIONAL CONFIGURATION DEFINING A REGULAR CURVILINEAR POLYGON**
**Theodor Koch, 7238 Oberndorf, (Neckar), Lehenhofweg 29, Germany**
**Continuation of application Ser. No. 670,654, Sept. 26, 1967, now abandoned. This application Nov. 7, 1969, Ser. No. 871,624**
**Int. Cl. F41c *21/00***
**U.S. Cl. 42—78** **9 Claims**



A rifled barrel intended for use with small arms, particularly in combination with steel-jacketed soft-core ammunition having no special rotating bands provided on the exterior thereof, which barrel has a cross-sectional configuration such that the interior surface of the barrel defines a regular polygon with rounded sides and corners, which corners form the rifling in the barrel wall and represent arc segments spaced uniformly about the interior surface and having a common radius of curvature, the rounded sides of the polygon extending between the rounded corners and representing arc segments having a common radius of curvature of lesser magnitude than the first-mentioned radius of curvature, the transitional regions between adjacent arc segments having different radii of curvature being continuous.

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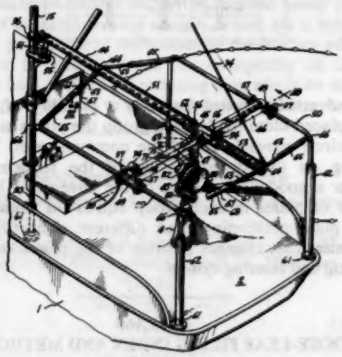
**3,643,365**
**MOUNTING MECHANISM FOR A SEINE-HAULING POWER BLOCK**
**Lawrence E. Demmert, 3408 Redwood Avenue, Bellingham, Wash.**
**Continuation-in-part of application Ser. No. 759,693, Sept. 13, 1968, now Patent No. 3,535,811. This application Jan. 5, 1970, Ser. No. 701**
**Int. Cl. A01k *73/12***
**U.S. Cl. 43—8** **9 Claims**



A trolley carrying the seine-hauling power block can be driven along an elongated track having its length extending athwartships of a boat. A carriage supporting such athwartships track can be driven along a fore-and-aft boom and the block trolley can be driven along the athwartships track so as to lay the seine back and forth in a pile below the block as it is hauled in. The athwartships track may include two quadrants having inboard ends parallel to each other and to the boom or such track may be straight. If the athwartships track includes two quadrants, the boom carriage carries a transfer track section which can be placed in registry with the inboard end of either arcuate track section by shifting such arcuate track sections transversely of the boom. Rollers mounted for engagement by a seine being hauled by the power block can guide and deter billowing of the seine.

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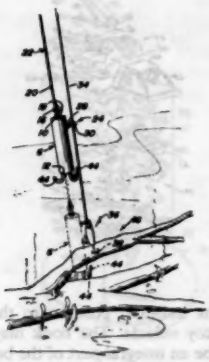
**3,643,366**
**LURE DISLODGING AND RETRIEVING DEVICE**
**Eugene R. Gates, 941 S. Gertrude Street, Stockton, Calif.**
**Filed Sept. 14, 1970, Ser. No. 71,651**
**Int. Cl. A01k *97/00***
**U.S. Cl. 43—17.2** **8 Claims**

A fish lure loosening and dislodging retriever comprising a weight provided at its upper end with a first eye to which a lifting line is connected and a second eye fixed on one side

below but adjacent the upper end and which embodies a pigtail coil and is detachably and slidingly connectable with the fishing line. This weight attaching eye is rigid and constitutes a lure knocker and is manipulable in a manner to hammer



and, as is ordinarily the case, free the snagged lure. If this step fails, the clawlike grappling hooks can be brought into play in a manner to lift the log or brush and render the lure accessible for removal by hand.

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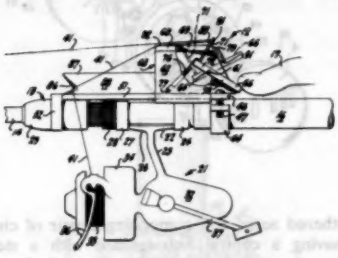
**3,643,367**

**THUMB RELEASE ATTACHMENT FOR SPINNING REEL**

**Frank E. Denny, 203 2nd Street P.O. Box 326, Hawthorne, Nev., and Douglas M. Denny, 724 Crane Avenue, Foster City, Calif.**

**Filed Dec. 4, 1969, Ser. No. 882,202**
**Int. Cl. A01k *89/02***
**U.S. Cl. 43—25** **4 Claims**



A housing located on top of the handle of a spinning rod possesses a thumb-actuated latch member capable of selectively retaining or releasing a fishing line extending from a spinning reel (located below the handle) upwardly to the latch member and thence forwardly through the line guides and tip eye to the terminal line tackle. The line is released by a slight movement of the thumb at the appropriate juncture in the casting operation.

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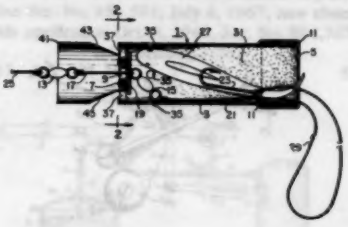
**3,643,368**

**SLIDING SINKER BAIT CARTRIDGE**

**Samuel T. Pool, P.O. Box 1102, Sacramento, Calif.**

**Filed Feb. 27, 1969, Ser. No. 802,901**
**Int. Cl. A01k *97/04***
**U.S. Cl. 43—41.2** **4 Claims**

A sliding sinker assembly for bottom fishing, comprising a cartridge in the form of a hollow tube open at one end and having a line passage through a wall at its other end, the tube being adapted to house live bait for casting, and having an



overall specific gravity greater than the water in which it is to be used.

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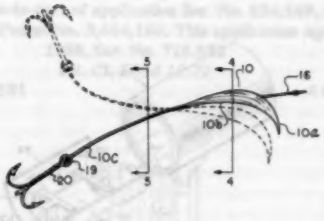
**3,643,369**

**FISH LURE**

**Earl D. Jacobson, 2037 West 4200 South, Roy, Utah**

**Filed June 8, 1970, Ser. No. 44,203**
**Int. Cl. A01k *85/00***
**U.S. Cl. 43—42.03** **2 Claims**



A fish lure having a body section formed of very thin, high-tensile strength, but flexible sheet metal. The body is shaped to provide a three-dimensioned perspective representation of a small bait fish. The body has upturned side flanges to serve as stiffeners for a portion of the body, the side flanges extending from a point just rearward of the leading edge of the nose to a point not exceeding one-half of the overall length of the body, the said flanges functioning to generally funnel water over the central portion thereof as it is traveled through water and the tail is dropped, whereby impinging water repeatedly flexes it up until it is repeatedly contacted and forced down by the funneled water.

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**3,643,370**

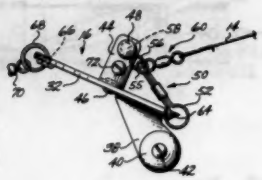
**DIVING SINKER MEMBER**

**John W. Cook, 1512 South 11, Mount Vernon, Wash., and Lester M. Davis, Gig Harbor, Wash., assignors to said Cook, by said Davis**

**Filed Aug. 12, 1970, Ser. No. 63,230**
**Int. Cl. A01k *95/00***
**U.S. Cl. 43—43.13** **8 Claims**

A diving sinker comprising a flat surface deck member and a keel extending downwardly therefrom, which may be integral and molded from a plastic. A support extends upwardly from a longitudinal midportion of the deck and terminates in one-half of a frictionally engageable and detacha-

ble coupling member. Link means has one end thereof swingingly connected to the forward end portion of the deck member and has the other end portion thereof terminating in the other half of the frictionally engageable and detachable coupling member. Adjusting means is provided for said



coupling member to adjust the frictional engagement between the two halves thereof. Fishing line receiving means is carried by an upper portion of said link means and the fishhook means and other fishing gear are connected to the trailing end portion of said deck member.

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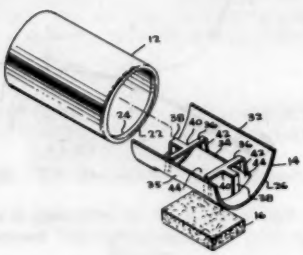
**3,643,371**

**INSECTICIDE APPARATUS**

**Walter C. Gordon, Arcadia, Fla., assignor to DeSoto Chemical Co., Inc., Arcadia, Fla.**

**Filed Sept. 2, 1969, Ser. No. 854,622**
**Int. Cl. A01m *25/00***
**U.S. Cl. 43—131** **10 Claims**



An insecticide apparatus comprising a substantially tubular housing having an open end and including a chemical exterminating means such as lead arsenate and a resilient flexible guard which must be squeezed to permit insertion into the open end of the tubular housing, and which is positioned over the chemical exterminating means to prevent the chemical exterminating means from being easily removed or improperly accessible either accidentally or intentionally by other than insects. A guard-holding lip is also positioned and projects across the portion of the open end to retain the guard in place after release. The guard may be made of any suitable plastic or other material which is flexible and resilient.

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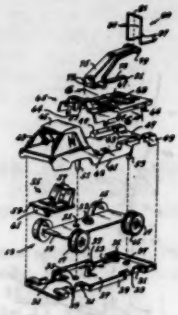
**3,643,372**

**TOY TOW TRUCK**

**Alan W. B. Nash, and Brian S. Prodger, both of Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Jan. 29, 1970, Ser. No. 6,675**
**Int. Cl. A63h *33/30***
**U.S. Cl. 46—40** **8 Claims**

A wheeled toy truck body is shown having a spring operated boom mounted therein, the boom holding a toy vehicle engaging member such as a hook. The boom is forced downwardly to lower the hook and engage and hold a portion of a toy vehicle to be towed and upon being released, the



boom returns to its unflexed position to thereby raise the hook and lift the toy vehicle. The hook may be a separate member or it may be an integral part of the boom.

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**3,643,373**

**TETHERED AERIAL TOP**

**Luther J. Russell, 524 Fernwood Road, Key Biscayne, Fla.**

**Filed Feb. 4, 1970, Ser. No. 8,588**
**Claims priority, application Spain, Feb. 5, 1969, 145,319**
**Int. Cl. A63h *1/30***
**U.S. Cl. 46—61** **5 Claims**

A tethered aerial top comprising a pair of circular disks each having a central hub formed with a stepped bore therethrough, a tubular shaft pressed into the larger-diameter portions of the bores and a rivet extending through the tubular shaft and having at one end a head abutting against the end face of the hub on one disk and means connected to the other end of said rivet and abutting against the end face of the hub of the other disk, to thereby securely hold the two disks in spaced and axial alignment with each other.

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**3,643,374**

**ACTION STAGE FOR DANCING DOLL**

**Gregory M. Gunther, Palos Verdes Estates; Ferenc Fekete, Inglewood; Ronald R. Liedtke, Redondo Beach, and Donald H. Stephens, Pomona, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Dec. 8, 1970, Ser. No. 96,032**
**Int. Cl. A63h *13/02***
**U.S. Cl. 46—139** **7 Claims**

A stage for use with a doll that can flex at the waist, to make the doll perform an entertaining dance, including a pair

of foot holders for engaging the feet of the doll. One of the foot holders is stationary while the other is vertically oscillated by an electric motor to cause the doll to sway at the waist. A child can operate a manual speed control to increase

the oscillation speed past the natural frequency of oscillation of the doll at the waist, to make the doll's swinging change from a large moderately slow movement to a rapid small movement.

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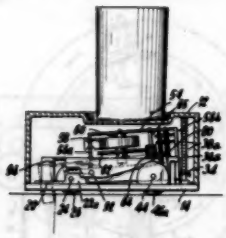
**3,643,375**

## MOVABLE SUPPORT

**Arthur Ginsberg, Great Neck, N.Y., and Atsumu Hirata, Tokyo, Japan, assignors to Royal London, Ltd., New York, N.Y.**

**Filed Oct. 13, 1969, Ser. No. 865,642**
**Int. Cl. A63h *17/00***
**U.S. Cl. 46—208** **6 Claims**



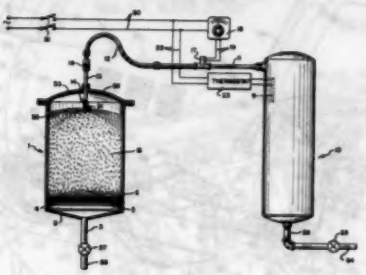
A moveable support which may be in the form of a coaster to support a glass and which operates in a manner to provide entertainment for the user. When a weight such as a glass filled with liquid is placed on the support, it automatically begins to move and stops as soon as the weight is removed. If after a weight has been placed on the support, and the support moves to the end of a surface, such as a table, the moveable support will automatically stop to prevent the moveable support from passing over the edge of the table.

**3,643,376**

## PRODUCTION OF SEED SPROUTS

**Everton G. Poindexter, and Hugh M. Scott, both of Monroe, Conn.**

**Continuation-in-part of application Ser. No. 736,468, June 12, 1968, now abandoned , Continuation-in-part of application Ser. No. 651,591, July 6, 1967, now abandoned. This application Oct. 8, 1969, Ser. No. 864,737**
**Int. Cl. A01g *31/02***
**U.S. Cl. 47—1.2** **5 Claims**



Sprouting various seeds and growing these sprouts for the purpose of providing edible sprouts as a vegetable.

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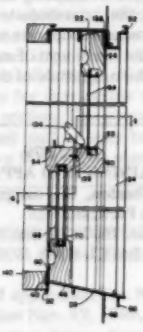
**3,643,377**

## WINDOW STRUCTURE

**Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.**

**Continuation-in-part of application Ser. No. 634,169, Apr., 1967, now Patent No. 3,464,160. This application Apr. 2, 1968, Ser. No. 718,052**
**Int. Cl. E05d *15/22***
**U.S. Cl. 49—181** **4 Claims**



Tilting double hung window construction, including a single plastic guide member at each side of a window sash for providing compression between a window frame and the window sash mounted therein and weatherstripping therebetween, as well as guiding the window sash in sliding movement relative to the frame and two-part pivoted camming and locking structure for securing the window sash in a tilted vertical position, especially in conjunction with counterbalance structure which is readily engageable with and releasable from the counterbalance structure.

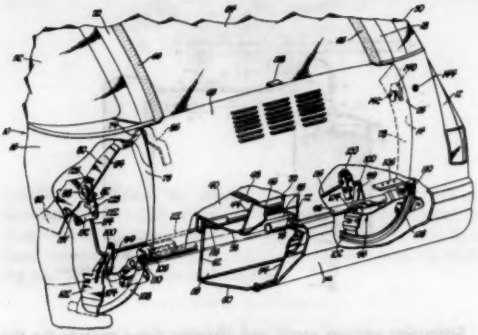
The window construction further includes unique single member glazing and mullion extrusions for facilitating glazing of the window structure and the sealing of window structures positioned side-by-side. Shipping clips for maintaining the frame of the window structure within predetermined limits during shipping and installing are also disclosed.

3,643,378

## HINGE COUNTERBALANCE

Alfonsas Velavicius, Warren, and Nicholas Toruk, Allen Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1970, Ser. No. 72,323
Int. Cl. E05d *13/10*; E06b *3/34*
U.S. Cl. 49—445 5 Claims



A closure is supported on a vehicle body for generally vertical bodily shiftable movement between open and closed positions relative to an opening in the vehicle body by a hinge arm supported on the vehicle body for pivotal movement about a first axis of the latter. The weight of the closure produces on the hinge arm about the first axis a gravitational turning moment which is counterbalanced by a hinge counterbalance according to this invention including a torsion rod with a crank thereon, an intermediate lever pivotally supported on the vehicle body, a connecting link between the torsion rod and the intermediate lever, cam means on the intermediate lever and follower means on the hinge arm. The torsion rod through the connecting link produces a primary turning moment on the intermediate lever while the cam means and follower means cooperate to produce a secondary turning moment on the hinge arm of magnitude varying in inverse proportion to the magnitude of the primary turning moment.

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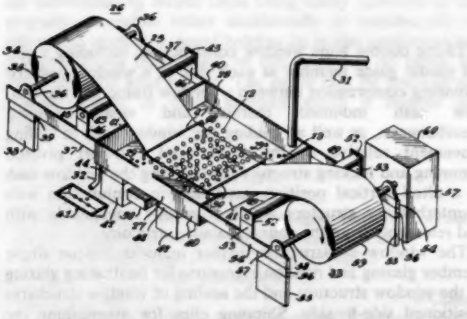
3,643,379

## CONTINUOUS GRAINING AND APPARATUS THEREFOR

Reno J. Testolin, Wheaton, Ill., assignor to The Richardson Company, Melrose Park, Ill.

Filed Mar. 16, 1970, Ser. No. 19,794
Int. Cl. B24b *19/00*
U.S. Cl. 51—6 11 Claims



This invention relates to the graining of metal sheet especially of the type employed as the supporting base for lithographic printing plates. More particularly, this invention relates to the continuous ball graining of such metal sheet and to apparatus for effecting such continuous ball graining.

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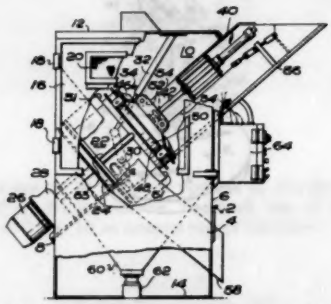
3,643,380

## APPARATUS FOR BLAST TREATING ARTICLES

James F. Thomson, Low House Farm, Timble, near Otley, Yorkshire, England

Filed June 2, 1970, Ser. No. 42,698
Int. Cl. B24c *3/28*
U.S. Cl. 51—13 8 Claims



Shot blasting apparatus comprising a blasting chamber, an inclined rotatable drum in the chamber for holding articles to be shot blasted, and means to raise and lower the drum to enable articles which have been shot blasted to leave the apparatus.

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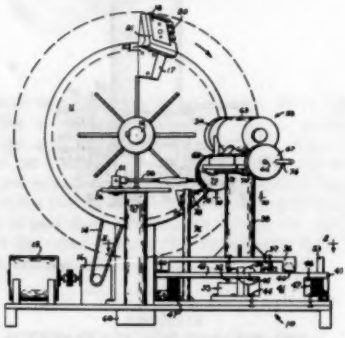
3,643,381

## KNIFE GRINDER

George M. Standal, 1916 San Fernando Place, Victoria, British Columbia, Canada

Filed Sept. 21, 1970, Ser. No. 74,093
Int. Cl. B24b *7/00*
U.S. Cl. 51—31 4 Claims



A knife grinder for chipping knives having plane beveled surfaces interconnected by a curved beveled corner surface. The knives are mounted on a rotatable head that carries them past a movable grinding unit. A powered grinding surface engages each knife while moving in an arcuate path about the corner axis of the knife along the line of engagement and while moving in arcuate paths about pivot axes per-

pendicular to the straight knife edges. The grinding unit is guided by a pivot frame and powered by a constantly turning crank. Automatic advancement of the grinding unit toward the knives is provided by a pawl and ratchet wheel engaged at the completion of each complete pass of the unit across the knife surfaces.

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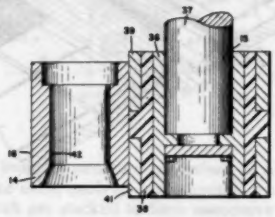
**3,643,382**

## GRINDING MACHINE

**Herbert R. Uhtenwoldt, Worcester; William H. Grotewold, Holden, and Norman S. Humes, Worcester, all of Mass., assignors to The Heald Machine Company, Worcester, Mass.**

**Filed Jan. 8, 1970, Ser. No. 1,378**
**Int. Cl. B24b** *5/18*
**U.S. Cl. 51—103 WH** **6 Claims**



This invention relates to a grinding machine and, more particularly, to apparatus for grinding large workpieces including a regulating roll having visco-elastic material contained in it and having a loading arm particularly adapted for use with a curved ramp for conveying the workpiece to and from the work area.

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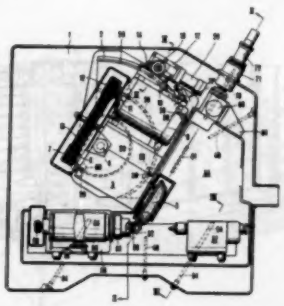
**3,643,383**

## GRINDING MACHINES

**Hiroaki Asano; Tsuyoshi Koide; Ikuo Ohtsu; Shozo Hayashi, and Hiroshi Kobayashi, all of Kariya-shi, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan**

**Filed Aug. 21, 1970, Ser. No. 65,942**
**Claims priority, application Japan, Aug. 30, 1969, 44/68866**
**Int. Cl. B24b** *5/00, 17/00*
**U.S. Cl. 51—105** **7 Claims**



In a grinding machine comprising a motor-driven grinding wheel and a headstock for holding a workpiece to be ground by the grinding wheel, the base for supporting the grinding wheel is secured to a stationary bed, a table for supporting the headstock is slidably mounted on the bed and a feed shaft is provided for the table to feed it toward the grinding wheel. The feed shaft is located in a plane perpendicular to the axis of the grinding wheel and passing through substantially the center of the width of the grinding wheel.

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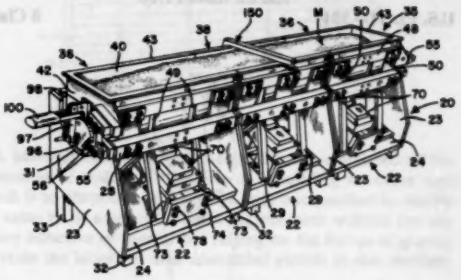
**3,643,384**

## VIBRATORY APPARATUS

**Max Isaacson, and Benjamin Smilg, both of Dayton, Ohio, assignors to Vibrodyne, Inc., Dayton, Ohio**

**Filed Mar. 11, 1969, Ser. No. 806,079**
**Int. Cl. B24b** *31/06*
**U.S. Cl. 51—163** **15 Claims**



A vibratory finishing machine includes an elongated container supported at longitudinally spaced intervals for oscillator movement at a predetermined natural frequency and on an effective axis offset laterally to a vertical plane extending through the center of the container. In one form, the container consists of longitudinally aligned and rigidly connected sections each supported by a plurality of aligned spring beams mounted on a corresponding frame section so that each container section has substantially the same natural frequency of oscillation. A pair of opposing magnets are mounted on each frame section to effect vibration of an armature rigidly connected to the corresponding container section, and each armature is generally aligned with the corresponding spring beams. Each pair of magnets is separately controllable to provide for varying the amplitude of oscillation of each container section. The container may also be enclosed to provide a ball mill or may be provided with end openings for progressive finishing an elongated part.

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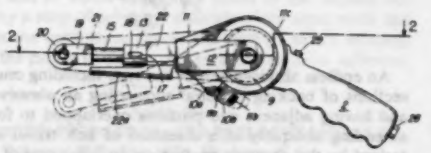
**3,643,385**

## PORTABLE GRINDING TOOL

**Toshio Mikiya, 17-10, 1 chome, Ikegami, Ota-ku, Tokyo, Japan**

**Continuation-in-part of application Ser. No. 729,692, May 16, 1968. This application Nov. 19, 1969, Ser. No. 877,987**
Claims priority, application Japan, Sept. 30, 1967, 42/62742; Dec. 27, 1967, 42/83308
**Int. Cl. B24b** *23/00*
**U.S. Cl. 51—170 EB** **24 Claims**



A portable grinding tool consisting of a handle, a telescopic holder and arm having a rotatable pulley attached to one end. The telescopic holder is adjustably fastened to the han-

dle at variable angles, and a rotatable driving member positioned within the holder is adapted to be driven by suitable power means so as to rotate a grinding belt entrained about and interconnecting the driving member and the rotatable pulley. Pressure plates for the belt and pulleys of various configurations may be interchangeably mounted for the effective and accurate grinding of different surfaces of a wide range of objects.

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3,643,386

## ABRASIVE HAND APPAREL

John V. Grzyll, 1040 Agate Street, St. Paul, Minn.

Filed Feb. 19, 1970, Ser. No. 12,707
Int. Cl. B24d 11/00
U.S. Cl. 51—391 8 Claims

Hand apparels, gloves and mittens, having abrasive material secured to the hand apparel at effective working areas such as extending beyond and partially around an extending member, finger or thumb, to afford cleaning and abrading contact with an object while providing various advantages and protections to the user.

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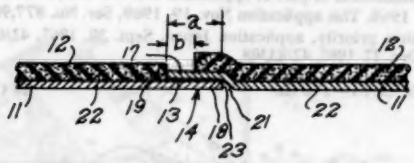
3,643,387

## ENDLESS ABRASIVE BELT HAVING AN OVERLAPPING JOINT

Hans Hildebrand, Koeln-Nippes, Germany, assignor to Norton Company, Worcester, Mass.

Filed May 18, 1970, Ser. No. 38,117
Claims priority, application Germany, May 16, 1969, P 19 25 151.5
Int. Cl. B24d 11/06
U.S. Cl. 51—399 4 Claims



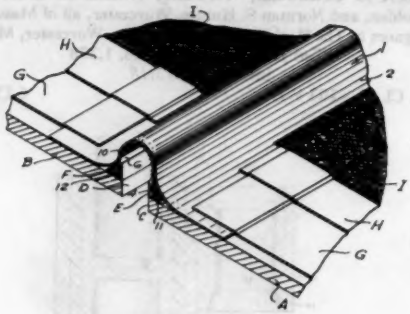

An endless abrasive belt of the type including one or more sections of backing material supporting an abrasive coating and having adjacent end portions overlapped to form joints extending obliquely of a direction of belt travel is characterized by the abrasive coating on an inner one of the overlapped end portions being removed over the longitudinal extent of the overlapping and the abrasive coating on an outer one of the overlapped end portions being removed only over a longitudinal extent in a range of about 30 to 80 percent of the overlapped distance.

3,643,388

## FLEXIBLE EXPANSION JOINT FOR STRUCTURES

Russell Dale Parr, and Leo Joseph Dete, Jr., both of Carlisle, Pa., assignors to Carlisle Tire and Rubber Division of Carlisle Corporation

Filed Jan. 9, 1968, Ser. No. 697,285
Int. Cl. E04d 1/36
U.S. Cl. 52—58 2 Claims




The present flexible expansion joint and joining member therefore is for structures which tend to move under varying conditions such as changes in temperature which cause expansion and contraction of the structure. To prevent possible damaging changes to the structure, extended portions thereof have one or more elongated openings therein which may be provided by spacing apart sections of the structure, positioning a sheet of flexible joining material in an arc across each opening and fastening a pair of flaps attached to said sheet, to the marginal portions of said structure on opposite sides of each opening.

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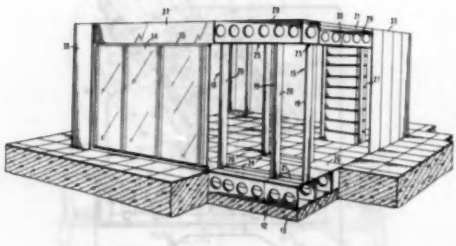
3,643,389

## MODULAR ELECTRICAL ENCLOSURE

William S. Sheppley, Jr., Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,238
Int. Cl. E04b 9/00; E04b 1/348, 5/48
U.S. Cl. 52—79 7 Claims



Modular frames are provided that support electrical components and other apparatus of a data-processing system. The frames are open at their front and back and are partially open along the two sides so that the components are easily accessible for maintenance and operation and are accessible for cooling and for wiring connections. The frames are combined with other components to form a room size, walk-in, enclosure.

3,643,390

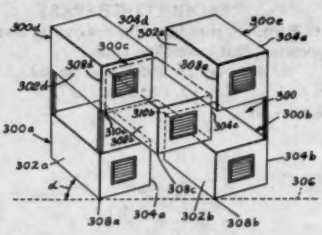
## MODULAR BUILDING STRUCTURE

Shelley W. Shelley, San Juan, P.R., assignor to Shelley Systems, Inc., Rio Piedras, P.R.

Continuation-in-part of application Ser. No. 762,668, Aug. 14, 1968, now Patent No. 3,503,170. This application Nov. 26, 1969, Ser. No. 880,316

Int. Cl. E04b *1/00*; E04c *3/10*

U.S. Cl. 52—79 18 Claims



A modular building structure comprised of a plurality of prebuilt boxlike units, each having sidewalls, a ceiling and a floor slab, which are stacked to form successive stories of a building. The units are positioned such that there is an open space between any two units on the same floor level. The interior units at intermediate levels are each stacked between at least four other units. In one embodiment the boxlike units have load-bearing vertical columns which are located inwardly with respect to the sidewalls, and the units are stacked such that at least portions of the sidewalls overlap sufficiently that one or more of the load-bearing columns of the upper and lower units are aligned. In high-level embodiments these columns are post-tensioned to form a unitary assembly. In some embodiments the units are arranged with their sidewalls perpendicular to the front of the building, while in other cases each of the walls meets the length of the building at an angle other than 90°.

3,643,391

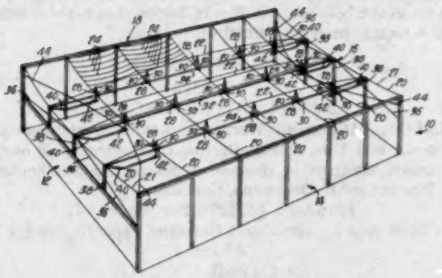
## ROOF CONSTRUCTION

Sebastian Mollinger, 17 Irving Place, Montreal 970, Quebec, Canada

Filed Oct. 3, 1969, Ser. No. 863,584

Int. Cl. E04b *7/14*

U.S. Cl. 52—83 8 Claims



A flexible roof structure supported by tension members extending in a catenary between the walls of the structure and a second set of tension members interconnected to the first set of tension members through a hold, the tension members of the first set in position and preventing undue flexing of the roof.

3,643,392

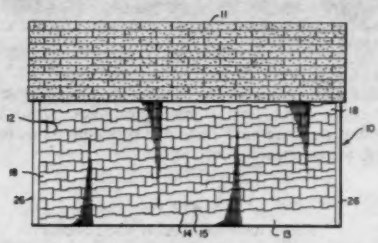
## BUILDING BLOCK AND STRUCTURE MADE THEREWITH

Charles Martinez, P.O. Box 362, Woldorf, Md.

Filed Jan. 28, 1970, Ser. No. 6,485

Int. Cl. E04c *1/10*

U.S. Cl. 52—262 5 Claims



A building block which is adapted to be employed in the formation of walls and the like of a building structure and which is so shaped as to interlock with one another to enable the same to be employed in this environment without the use of any adhesive or mortar but relying on the forces of gravity to retain the blocks in their assembled elation to one another.

3,643,393

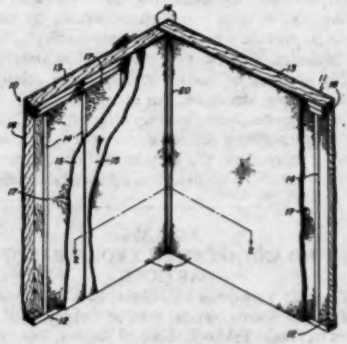
## BUILDING CONSTRUCTION

Edwin A. Pierce; Richard W. Knob; Samuel O. Roth, all of Piqua, and Emery L. McKinney, Troy, all of Ohio, assignors to Inland Systems, Inc., Piqua, Ohio

Filed Mar. 30, 1970, Ser. No. 23,816

Int. Cl. E04b *1/40*; E04c *1/40*

U.S. Cl. 52—287 9 Claims



Modular building construction in which the walls of each module are manufactured as panels consisting of one or more gypsum board subpanels secured to a core of studs and plates and overlaid with a continuous sheet of embossed, polyvinyl chloride, and in which the corner joints of the module are covered by a strip of polyvinyl chloride of the same color and texture as the continuous sheets and secured to the adjacent edges of the panels by means of a pressure-sensitive adhesive.

3,643,394

## INSULATED PREFABRICATED BUILDING MODULE

Bobby G. Johnson, P.O. Box 1621, Durham, N.C.

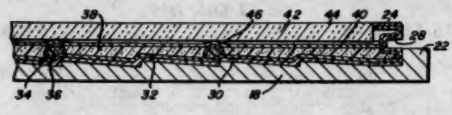
Filed Oct. 24, 1969, Ser. No. 869,054

Int. Cl. E04b *2/10*, *2/38*; E04d *3/35*

U.S. Cl. 52—309 5 Claims

A building structure module in the form of a wall panel capable of load bearing constructed of glass fiber reinforced

plastic resin, semicylindrical structural members for load bearing and reinforcement and foam plastic for insulation purposes with the module having fire-retardant properties and a peripheral edge channel member to enable adjacent



modules to be readily interconnected. The module is constructed by employing a procedural method so that the sequential steps are performed in a production line technique to facilitate construction of the modules.

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**3,643,395**

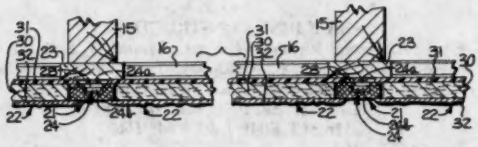
**REVERSIBLE WALL ASSEMBLY**

**Richard C. Schuyler; Jacquie G. Schuyler, both of 6120 Elmwood Circle, Charlotte, N.C.; Margaret E. Griffin, 1336-A Green Oak Lane, Charlotte, N.C.; William E. Tobias, 3108 Buckeye Drive, West Columbia, S.C., and Jack R. Finney, 901 Frink St., Cayce, S.C.**

**Filed Dec. 15, 1969, Ser. No. 884,872**

**Int. Cl. E04b *2/06***

**U.S. Cl. 52—509** **6 Claims**



A wall assembly for mounting on a substantially planar supporting wall structure and characterized by being easily reversible to provide a desired decorative effect. The wall assembly includes at least two elongated splines which are removably secured in spaced-apart parallel relation to the planar supporting structure. An elongate planar wall panel including opposite faces having different surface characteristics for providing a desired decorative appearance on opposite faces thereof has the longitudinal edges thereof reversibly interconnected with proximal edges of the splines.

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**3,643,396**

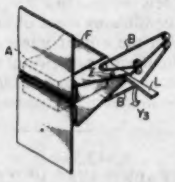
**METHOD AND APPARATUS FOR WRAPPING AN ARTICLE**

**Shozo Togashi; Yoshijima Makijima, both of Kawasaki; Ikuo Tanaka, and Kaoru Narita, both of Tokyo, all of Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan**

**Filed May 8, 1970, Ser. No. 35,699**

**Int. Cl. B65b *63/02***

**U.S. Cl. 53—24** **7 Claims**



An article to be wrapped such as a bundle of newspapers is firstly compressed so as to decrease its height, then it is moved forwardly in compressed state toward a sheet of thermoplastic resin film which is stretched tightly across the course of movement of the article so that the article is wrapped by the film from its forward end toward its rear end as the article continues its advancement. When the article is wrapped by the film over its upper and lower surfaces, it is stopped and the film portions at the rear of the article are fuse welded. Upon completion of the fuse welding, the film edges projecting transversely beyond the article are folded together and joined upon further advancement of the article.

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**3,643,397**

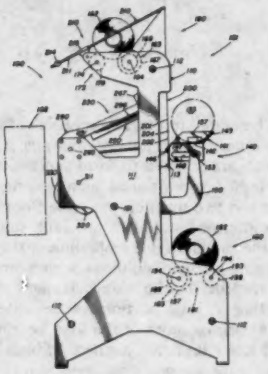
**PACKAGING MACHINE AND METHOD AND ARTICLE PRODUCED THEREBY**

**Erwin B. Bahnsen, Hinsdale, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah**

**Filed May 28, 1969, Ser. No. 828,533**

**Int. Cl. B65b *9/02*, *57/12***

**U.S. Cl. 53—28** **26 Claims**



A machine for packaging a workpiece in a heat-sealable film, including a U-shaped sealing pad and heater, means for establishing a longitudinal reach of film adjacent to the sealing pad, the sealing pad and the heater being movable between a receiving position and a sealing-severing position, means for urging the workpiece against the reach of film when the heater and the sealing pad are in the receiving position to provide superimposed lengths of film positioned between the sealing pad the the heater and forming an envelope open along one side and the ends of the workpiece, the heater in the sealing-severing position overlying the sealing pad and being in contact with the superimposed lengths of film to seal and sever the same along the one side and the ends of the workpiece. A method for packaging the workpiece in the heat-sealable film is disclosed as is the article of manufacture produced thereby.

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**3,643,398**

**BOTTLE CAPPING MACHINE**

**Karl Quest, Dortmund; Werner Heckmann, Dortmund-Aplerbeck, and Uwe Knabe, Dortmund-Hombruch, all of Germany, assignors to Holstein & Kappert, Maschinenfabrik Phoenix GmbH, Dortmund, Germany**

**Filed Sept. 14, 1970, Ser. No. 71,941**

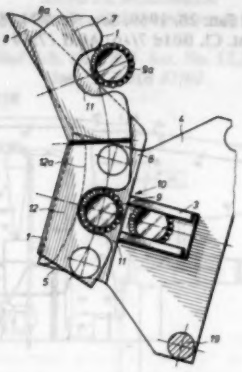
**Claims priority, application Germany, Sept. 18, 1969, P 19 47 169.3**

**Int. Cl. B65b *57/00*, *7/28***

**U.S. Cl. 53—77** **10 Claims**

A bottle capping machine wherein the capping units orbit about a vertical axis and have sockets which travel past a transfer station where each socket receives a cap which is thereupon engaged by a permanent magnet and is lifted toward a sealing ram of the respective unit while the latter moves toward registry with a filled bottle. The transfer station accommodates a vertically adjustable platform which

supports a chute for delivery of caps to successive sockets and a stop which centers the caps in the sockets to place them into an optimum position for engagement with the



respective magnets. A deflector is mounted on the platform to expel, if necessary, from successive sockets caps and/or fragments of bottles before such sockets reach the transfer station.

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**3,643,399**

**MACHINE FOR DOSING AND FILLING THICK LIQUIDS INTO BAGS OF PLASTIC MATERIAL**

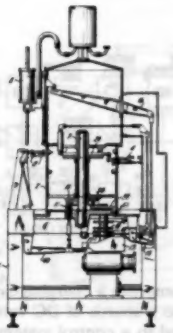
**Guido D. Bertoglio, Lugano-Viganello, Switzerland, assignor to Centra Anstalt, Vaduz, Liechtenstein**

**Filed Sept. 2, 1969, Ser. No. 854,635**

**Claims priority, application Switzerland, Oct. 31, 1968, 16305/68**

**Int. Cl. B65b *43/29, 3/32***

**U.S. Cl. 53—187** **6 Claims**



An arrangement for metering and filling plastic bags with thin and thick liquids. A rotary member is intermittently indexed and carries a plurality of jaws equipped with suction means for holding the bag to be filled at the open edges. Metering cylinders fill the bag with a predetermined quantity of liquid, after which the bag is sealed through thermopulse welding. Indexing is accomplished through a maltese-cross device which is indexed and stopped through a cam-operated indexing mechanism. The indexing mechanism also operates the metering cylinders. A closure device closes the bag after filling and before indexing the rotary member to the next station.

**3,643,400**

**SYSTEM FOR THE CRATING OF FLOATABLE GOODS**

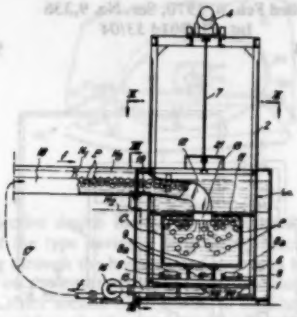
**Robert Louis Barbet, 35 bis Rue Pasteur, Chateau-du-Loir, Sarthe, France**

**Filed Feb. 26, 1970, Ser. No. 14,545**

**Claims priority, application France, Mar. 4, 1969, 6905887**

**Int. Cl. B65b *5/00, 39/14***

**U.S. Cl. 53—/248** **10 Claims**



Apples or other floatable goods are loaded into a perforated container through a duct terminating in a screen at the top of a cage immersed in a water bath, the water being circulated by a pump to drive the goods into the duct from a channel aligned therewith. The cage is then lifted out of the bath to the level of a track while a pair of spring-loaded container-supporting bars are depressed to lower the loaded container onto a set of rollers whence it can be discharged onto the track preparatorily to the introduction of the next container.

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**3,643,401**

**APPARATUS FOR PACKING PIECE GOODS, PARTICULARLY FRUITS, INTO A HOSE-SHAPED PACKING MATERIAL**

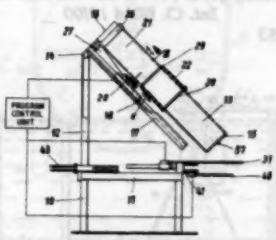
**August Wickersheim, 4, Industriestrasse, Egenbuttel near Hamburg, Germany**

**Filed May 5, 1970, Ser. No. 34,841**

**Claims priority, application Germany, May 8, 1969, P 19 23 508.6**

**Int. Cl. B65b *5/00, 39/12***

**U.S. Cl. 53—266** **15 Claims**




A fully automatic apparatus for packing discrete articles such as fruits into a hose-shaped packing material and sealing a filled package at both ends. The apparatus comprises two coaxially arranged pipes whereby the outer pipe is slidably mounted on the inner pipe and holds a supply of the hose material and part of a brake device. The articles are passed through the inner pipe into the hose which is closed at its bottom end by a conventional closing and severing device in timed relationship to the movement of the outer pipe along the inner pipe. Below the pipes is arranged a clamping ring

controlled in its movement by the closing and severing device and serving to constrict the hose into a suitably narrow neck portion at which the hose may then be closed and severed.

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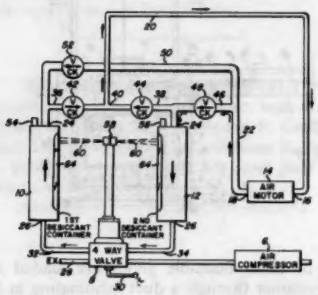
3,643,402

## METHOD AND APPARATUS FOR SUPPLYING DEHYDRATED AIR TO AIR-OPERATED MECHANISMS

Wallace H. Wireman, 3514 Handman Avenue, Cincinnati, Ohio

Filed Feb. 6, 1970, Ser. No. 9,336
Int. Cl. B01d 53/04
U.S. Cl. 55—33 9 Claims




The apparatus supplies thoroughly dehydrated super-clean air to an air-operated mechanism in a closed dehydration, pressure differential reactivation system. In the operation of the apparatus, dehydrated air, under pressure supplied to an air-operated mechanism, is exhausted from said mechanism as spent dry air at a lowered pressure, but without substantial reduction in volume, and is then without loss of any volume utilized to reactivate one or the other of a pair of dehydrators incorporated in the system. The entire exhaust from the air-operated mechanism is utilized to reactivate one dehydrator, while the other dehydrator gathers moisture from the air supplied to the air-operated mechanism. The arrangement eliminates the need for heat in effecting reactivation of the dehydrators.

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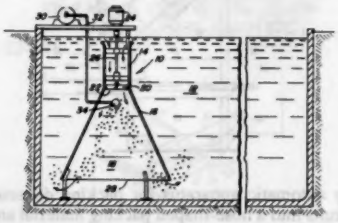
3,643,403

## DOWNFLOW BUBBLE CONTACT AERATION APPARATUS AND METHOD

Richard E. Speece, 6205 Shoal Creek Blvd., Austin, Tex.

Filed Apr. 29, 1970, Ser. No. 32,846
Int. Cl. B01d 19/00
U.S. Cl. 55—53 11 Claims



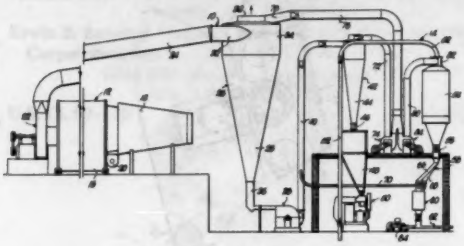
Oxygen deficient water is aerated by dispersing bubbles of air or oxygen gas in a forced downflow of water through a downwardly diverging funnel trapping the bubbles therein for prolonged contact with the water. The bubbles are displaced by crowding from the lower end of the funnel after some of the oxygen has been absorbed in the water and in some cases partially replaced by nitrogen gas stripped from the water.

3,643,404

## METHOD AND APPARATUS FOR ENHANCING THE SEPARATION OF PARTICULATE MATERIAL FROM AN EFFLUENT STREAM

Richard L. Ronning, 9714 West 91st Terrace, Overland Park, Kans.

Filed Jan. 28, 1969, Ser. No. 794,652
Int. Cl. B01d 7/16; A01f 17/84
U.S. Cl. 55—92 10 Claims



A method and apparatus for minimizing the particulate material content from an effluent stream of gases by enhancing the efficiency of centrifugal separation. A conduit feeds a stream of cooling gases into the separator to cool the effluent stream closer to its dew point. Condensing moisture collects on the particles, augmenting the mass of each particle so that separation by centrifugal force is enhanced.

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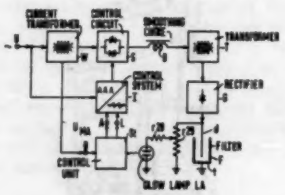
3,643,405

## CIRCUIT ARRANGEMENT FOR AUTOMATIC CONTROL OF THE VOLTAGE OF AN ELECTRICAL FILTER

Lovro Vukasovic, and Rudolf Hofmann, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 6, 1970, Ser. No. 17,176
Claims priority, application Germany, Mar. 8, 1969, P 19 11 924.5; P 19 11 925.6
Int. Cl. B03c 3/66
U.S. Cl. 55—105 11 Claims




A control unit comprises a charging circuit which connects a guide capacitor to a source of DC voltage whereby a control voltage supplied to a control system is produced by the control unit in accordance with the voltage of a guide capacitor. A discharging circuit is connected in parallel with the guide capacitor and includes a controllable resistor having a resistance value dependent upon the voltage of the filter. A photoelement is in operative proximity with a glow lamp in a manner whereby light produced by the glow lamp impinges on the photoelement. The photoelement is coupled by a circuit to the discharging circuit for supplying a control signal dependent upon the irradiation of the photoelement whereby the control signal controls the controllable resistor of the discharging circuit to a low resistance value when the glow lamp does not glow and controls the controllable resistor to a high resistance value when the glow lamp glows. A cutoff circuit supplies a cutoff signal to the control system and the

control system controls a control circuit to interrupt the filter current without delay when a sparkover occurs in the filter.

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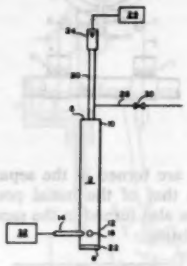
3,643,406
SAMPLE SCRUBBER
Otis E. Ririe, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Feb. 18, 1970, Ser. No. 12,388
Int. Cl. B01d 47/00
U.S. Cl. 55—238 5 Claims



Apparatus for breaking up, cooling, and water scrubbing solids and oils from a sample vapor stream.

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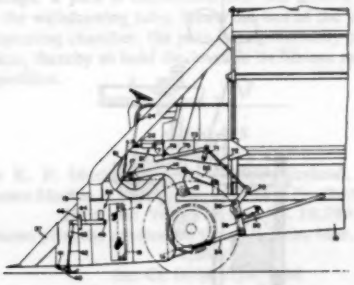
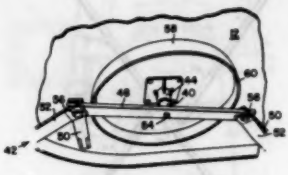
3,643,407
AUTOMATIC HEIGHT ADJUSTMENT OF CROP HARVESTER
Arthur Lowell Hubbard, and Leon Franklin Sanderson, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Oct. 26, 1970, Ser. No. 83,769
Int. Cl. A01d 45/18
U.S. Cl. 56—10.2 20 Claims



A crop harvester, particularly of a cotton-picker-type in which the row unit is suspended on a main supporting structure to rock about a transverse axis and in which there is provided a hydraulic motor for rocking the unit so as to raise and lower the forward end which is controlled by a ground-sensing device at the forward end of the row unit. The unit is further characterized by having a hydraulic cylinder which will raise and lower the structure suspending the unit and the hydraulic cylinder is controlled through a valve and mechanical linkage connection to the row unit that actuates the latter hydraulic cylinder upon the row unit being rocked beyond a predetermined range of movement.

3,643,408
PROTECTIVE DEVICE FOR ROTARY MOWERS
John Kulak, Port Colborne, and Kenneth Lawrence Kirkpatrick, Welland, Ontario, both of Canada, assignors to Deere & Company, Moline, Ill.
Filed July 20, 1970, Ser. No. 56,477
Int. Cl. A01d 35/26
U.S. Cl. 56—17.4 4 Claims



A protective device for use in conjunction with a rotary mower of the type having a housing, a vertical driven shaft extending through the housing, and a cutting blade assembly mounted on the lower end of the shaft, the assembly consisting of a center section rigidly fixed to the shaft for rotation therewith, and a pair of outer sections pivotally connected to the outer ends of the center section. The device, which serves the dual function of, first, limiting the deflection of the center blade section, and, secondly, shielding the vertical shaft and center blade section from stumps and similar obstructions, consists of a circular ring mounted on the housing concentrically with the shaft and having a lower edge terminating in close proximity to the center blade section, the outer circumference of the ring being located just inwardly of the pivotal connection between the center and outer blade sections.

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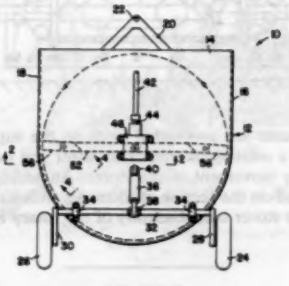
3,643,409
MOWER BLADE
William Archibald Jones, Fonthill, Ontario, Canada, assignor to Deere & Company, Moline, Ill.
Filed Nov. 5, 1970, Ser. No. 87,188
Int. Cl. A01d 55/18
U.S. Cl. 56—295 6 Claims

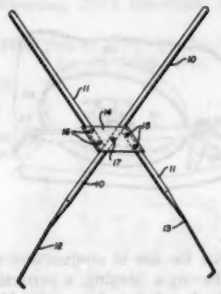


A mower blade assembly for use in a rotary mower having a vertical, power-driven shaft, the assembly consisting of an elongated blade carrier rigidly secured at its midpoint to the vertical shaft for rotation therewith, and a pair of vertically offset cutting blades swingably mounted on opposite ends of the carrier. The cutting blades are swingable about axes sloping downwardly, radially inwardly, and tangentially rearwardly relative to the direction of rotation of the carrier, whereby the outer ends of the blades move upwardly to provide increased ground clearance as they are swung from an operative, radially outwardly extending position, to an inoperative, tangentially rearwardly extending position.

## 3,643,410
## RAKE AND TONGS COMBINATION

Walter A. Menning, 122 Harvard Street, Youngstown, Ohio

Filed Dec. 17, 1970, Ser. No. 99,126
Int. Cl. A01d 7/10
U.S. Cl. 56—400.12 5 Claims

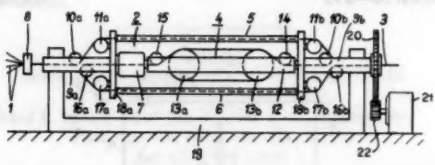


A lawn tool in the form of a pair of leaf rakes, the handles of which are crossed and pivoted to one another with one of them being offset to increase the area between the rake portions is disclosed which tool may be used as a grass or leaf rake and also as a grass or leaf pickup and carrying tongs by moving the rake portions relative to one another by their pivoted handles.

## 3,643,411
## METHOD AND APPARATUS INCLUDING A ROTATING INTERMEDIATE STORER FOR SZ TWISTING OF ELEMENTS OF A CABLE

Dieter Vogelsberg, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 29, 1970, Ser. No. 6,663
Claims priority, application Germany, Feb. 7, 1969, P 19 06 997.7
Int. Cl. H01b 13/04
U.S. Cl. 57—34 AT 11 Claims



The elements are pretwisted prior to the supply of such elements to a rotating intermediate storer and independently of the rotary movement of the storer. An additional twist is superimposed on the section of elements withdrawn from the intermediate storer independently of the rotary movement of the storer.

## 3,643,412
## METHOD AND APPARATUS FOR THE PRODUCTION OF CRIMPED YARNS

Yutaka Maeda, Fujiyoshida-shi; Hiroshiro Kimura; Akio Koshimo, both of Uji-shi; Nagamasa Kanzaki, Kyoto-fu; Katsumi Yasuzuka, and Yoshinobu Furukawa, both of Uji-shi, all of Japan, assignors to Nippon Rayon Company Limited, Uji-shi, Japan

Filed Sept. 26, 1969, Ser. No. 861,309
Claims priority, application Japan, June 18, 1969, 44/56831
Int. Cl. D02g 1/02
U.S. Cl. 57—34 HS 11 Claims

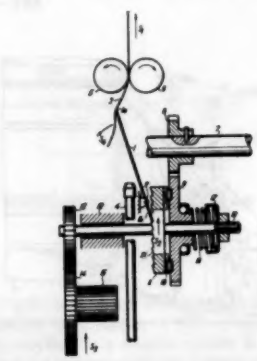
The production of crimped yarns in which at least two yarns are fed under tension to a common twisting zone, wherein the yarns are pretwisted together and heated so as to be under a plastic state at least in a part of the zone. The yarns are thereafter separated into individual yarns by being pulled apart in different directions and at the same speed.

The twisted yarns are turned at the separating point in the same direction as that of the initial pretwisting while the separated yarns are also turned in the same direction as that of the initial pretwisting.

## 3,643,413
## MECHANICAL CHECKING DEVICE FOR CONTROLLING THE OPERATION OF SPINNING UNIT

Brazda Ladislav, deceased, late of Cerveny Kostelec, Czechoslovakia (by Drahuska Brazdova and Dagmar Brazdova, heirs); Miloslav Prochazka, Nachod; Karel Kaulich, and Josef Ozdian, both of Cerveny Kostelec, all of Czechoslovakia, assignors to Elitex, Zavodytextilniko Strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia, by said Prochazka, Kaulick, and Ozdian

Filed Feb. 25, 1970, Ser. No. 13,958
Claims priority, application Czechoslovakia, Mar. 6, 1969, 1636/69
Int. Cl. D01h 13/16, 1/12
U.S. Cl. 57—83 10 Claims



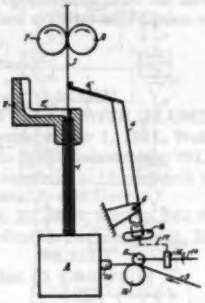
A mechanical checking device for controlling the operation of a spinning unit for manufacturing yarn. The checking device includes a feeler which is freely movable from a first position in which it engages the yarn being pulled under tension from the spinning unit to a second position when such yarn breaks. Fibrous material is fed into the spinning unit by a driven roller, there being a controllable clutch interposed between such roller and a driving means. The clutch remains engaged when the feeler is in its first position; when the yarn breaks, however, the feeler acts mechanically effectively to disengage the clutch and to stop the feeding of fibrous material into the spinning unit.

3,643,414

## CHECKING MECHANISM FOR DETECTING YARN BREAKAGES IN OPEN END SPINNING MACHINES

Miloslav Procházka, Nachod, and Karel Kaulich, Cerveny Kostelec, both of Czechoslovakia, assignors to Elitex, Zavody textilního strojírenství, Liberec, Czechoslovakia

Filed Mar. 9, 1970, Ser. No. 17,734
Claims priority, application Czechoslovakia, Mar. 10, 1969, 1715/69
Int. Cl. D01h 13/18, 13/16, 1/12
U.S. Cl. 57—83 7 Claims



Yarn breakage-detecting mechanism for open end spinning machines, such as those in which a spinning chamber is used which operates under pressure. On the outer end of the withdrawing tube of the chamber there is a sidewardly extending extension piece having a groove on its upper surface communicating with the mouth of the tube. A yarn tension checking and fibrous material feeding controlling lever is mounted on a pivot at one side of the tube, the lever having a plate attached to its upper end. The parts are so arranged that when the yarn is unbroken and extends from the mouth of the tube to yarn-withdrawing rolls, the yarn engages the outer edge of the plate to maintain the lever in its fibrous material feeding position. When the yarn breaks, the lever tips to stop the feeding of fibrous material, the plate then covering the groove on the extension. To repair the breakage, a yarn is introduced into the groove and thence into the withdrawing tube. When the end of the yarn is inside the spinning chamber, the yarn is automatically placed under tension, thereby to hold the lever in its fibrous material feeding position.

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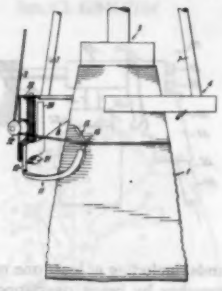
3,643,415

## FLYERS

John K. P. Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Mar. 16, 1970, Ser. No. 19,789
Claims priority, application Great Britain, Mar. 18, 1969, 14,201/69
Int. Cl. D01h 7/24, 1/04
U.S. Cl. 57—117 7 Claims

A device for winding packages of synthetic plastic tape includes a member for controlling the lay of the tape which is designed to overcome the problems of the ridging normally encountered. The device may comprise a part which is traversed in relation to a rotary support or may be a flyer driven round the axis of a stationary support in which case the member is in the form of a finger which has at its package-engaging end a tape guide on its outer surface for controlling the lateral movement of the tape and on its inner surface directly opposite the tape guide an inwardly projecting nose portion shaped for engaging the surface of the package over a width less than that of the tape guide. The end of the finger adjacent the nose portion is capable of elastic displacement, preferably resulting from the resilience of the finger itself, in a direction axial of the package in relation to its support by a distance equal to at least half the width of the tape guide. If ridging starts the nose portion will engage the intervening depressions to wind tape in the



depressions and as a result of the elastic displacement will tend to dwell for a short period in each depression until it jumps to the next depression. In this way a smooth surfaced package is formed.

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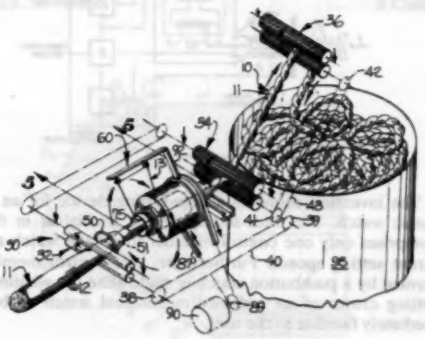
3,643,416

## COMPACT TEXTILE TOW AND METHOD FOF FORMING SAME

John W. Andrews; William J. Schmiel; Gene E. Inman, all of Charlotte, and James Phillip Jones, Matthews, all of N.C., assignors to The Railway Supply & Mfg. Co., Charlotte, N.C.

Filed Dec. 10, 1969, Ser. No. 883,777
Int. Cl. D01g 1/00
U.S. Cl. 57—142 17 Claims



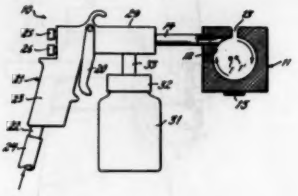
A compact textile tow adaptable for forming staple fibers therefrom comprising an elongate condensed bundle of a plurality of textile filaments having an inherent tendency to expand to a greater cross-sectional area, and a yarn spirally wound around the bundle of filaments and maintaining the same in the condensed condition. The method comprises feeding an elongate bundle of a plurality of textile filaments in a predetermined path of travel while condensing the same to a smaller cross-sectional area and while spirally winding a yarn around the same to maintain the bundle of filaments in condensed condition by opposing the inherent tendency of the bundle of filaments to expand.

3,643,417

## SPLICING OF TEXTILE STRANDS

Malcolm F. Irwin, Philadelphia, Pa., assignor to Techniservice Corporation, North Kennett Square, Pa.

Filed Oct. 27, 1969, Ser. No. 869,581
Int. Cl. D02g 3/00; D01h 13/30
U.S. Cl. 57—142 10 Claims



Textile strands, including at least one monofilament strand, are spliced together by being overlapped and subjected to fluid rotating circumferentially thereof, which swirls the overlapped component filaments into interengagement so that the strands will not be separated by applied tensions. Gun-type apparatus is provided for applying air or the like as the swirling fluid and for applying an auxiliary adhesive material in like manner.

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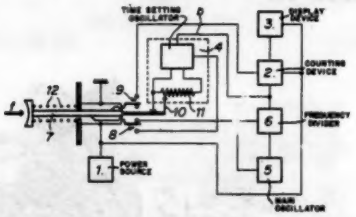
3,643,418

## TIME-SETTING DEVICE FOR AN ELECTRONIC WATCH

Herbert S. Polin, and Gustavo Kuhn, both of Veyrier, Switzerland, assignors to Paul Vogel, Geneva, Switzerland

Filed May 6, 1970, Ser. No. 34,928
Claims priority, application Switzerland, Aug. 27, 1969, 8127/69
Int. Cl. G04c 3/00; G04b 27/00
U.S. Cl. 58—23 7 Claims




The invention concerns a time-setting device for an electronic watch. This time-setting device is original in that it comprises only one control member to set the watch at different setting speeds. Furthermore, this control member is formed by a pushbutton which is made alike the winding and setting crown of an ordinary mechanical watch to be immediately familiar to the user.

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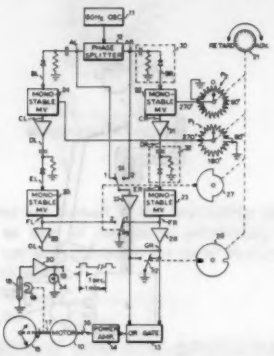
3,643,419

## APPARATUS FOR FINE ADJUSTMENT OF SIGNAL FREQUENCY

Nathaniel Motta, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 14, 1969, Ser. No. 841,359
Int. Cl. G04c 3/00; H03k 5/00, 17/00
U.S. Cl. 58—23 16 Claims

A clock is so driven by a constant frequency signal through a phase splitter that, to advance or retard the time in increments of half the cycle period of the constant frequency signal, a control knob is turned clockwise or counterclockwise in half-turn increments. A pair of annular potentiometers, each having a single point connected to ground, are driven by the knob in such a fashion that while the resistance of one is cyclically increasing and decreasing, the other is cyclically decreasing and increasing. The separate potentiometers are connected to monostable multivibrators (MV's) triggered by the frequency standard to vary their duty cycles as a function of resistance. Each variable MV triggers a separate MV at the end of its duty cycle to produce output pulses having fixed durations equal to the period of half a cycle of the constant frequency signal. The device is




driven alternately by output pulses of the separate MV while time is being adjusted. A cam synchronizes the transfer from one output MV to the other at the midpoint of a half turn of the knob thereby allowing the phase of the frequency standard applied to the motor to be advanced or retarded 90° through one MV and another 90° through the other MV. A magnet is driven by the clock motor in a circular path over a reed switch to periodically produce a pulse to be used as a time signal from the clock and in comparing the time of the clock with a time standard to within a fraction of a second.

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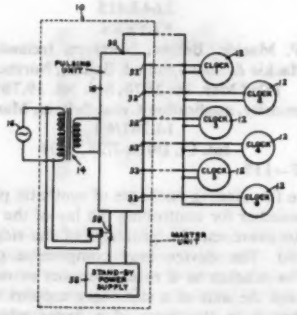
3,643,420

## CLOCK SYSTEM

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed Oct. 14, 1969, Ser. No. 866,322
Int. Cl. G04c 13/02, 13/04
U.S. Cl. 58—24 17 Claims




A master-slave clock system for use with a source of alternating current of uniform frequency with translates the frequency of the source into readable time by dividing or counting the frequency into submultiples, by distributing clock pulses to the slave clocks at this submultiple frequency

and by using stepper motors in each clock to intermittently advance the clock a predetermined discrete step in response to receipt of each clock pulse. In certain embodiments, in which no more than one slave clock operates at the same time, the pulses are distributed to the successive clocks in sequence. In other embodiments all of the slave clocks advance simultaneously. In certain embodiments each slave clock includes a trigger circuit which momentarily connects a direct current power source in the clock across the clock's stepper motor on receipt of a pulse, and low power rectified current is fed to this source between the pulses. The entire system requires only one to two watts of power for its operation. The system is uniquely suitable for use with a standby power source which continues to drive the slave clocks in the event of a power failure or other interruption of the incoming signal.

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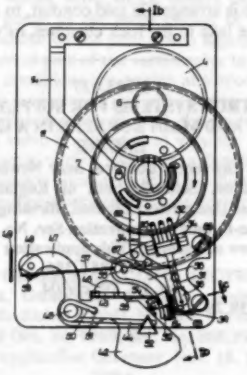
3,643,421

## ELECTRIC ALARM CLOCK WITH ILLUMINABLE FACE

Friedrich Herr, Hubertusstrasse 1, 7911, Wullenstetten, and Jurgen King, Erich Rittinghausstrasse, 7913 Senden/Iller, both of Germany, assignors to Uhrenfabrik Sender GmbH, Sender/Iller, Germany, by said Herr

Filed Sept. 29, 1969, Ser. No. 861,902
Claims priority, application Germany, Sept. 28, 1968, P 17 98 352.7
Int. Cl. G04b *19/34*
U.S. Cl. 58—50 26 Claims



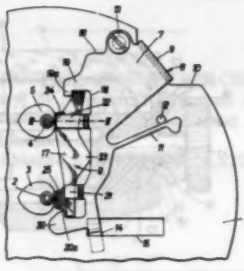
An electric alarm clock has an hour wheel which can move axially to engage with several teeth in an alarm-hour setting wheel and make an electrical contact therewith by means of a protruding metallic tongue on a conductive plate mounted on the nonconductive hour-wheel. This tongue makes a brief contact until further rotation of the hour wheel allows it to drop into the hole and open the circuit for the alarm. A second pair of contacts in series with the first-mentioned pair is closable on axial shifting of the hour-wheel into the alarm wheel. A contact-breaking arm of nonconductive material can be pushed between these second contacts and is clamped by them there until the hour-wheel is automatically cammed out of and away from the alarm wheel, whereupon the contact-breaking arm is released. Depression of a button on the clock lights a lamp for illuminating the clock dial face and can shift the contact-breaking arm toward the second contacts to open same. Means is provided to prevent pivoting of the contact-breaking arm between the contacts except when the teeth of the hour-wheel are engaged fully in the holes in the alarm wheel.

3,643,422

## CHRONOGRAPH MOVEMENT

Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed June 8, 1970, Ser. No. 44,512
Claims priority, application Switzerland, June 10, 1969, 8820/69
Int. Cl. G04f *7/04*
U.S. Cl. 58—74 4 Claims



This invention is exemplified by a hammer made in two pieces, a body piece and a lever piece. The hammer is used to return heart cams such as are used in stopwatches and counting devices to the zero position when a button is pressed. The hammer disclosed consists of a pivoted part which coacts with the button and a lever part which is held between the pivoted part and a platen in such a way that it drives the heart cams to zero position when the pivoted lever engages it at one point.

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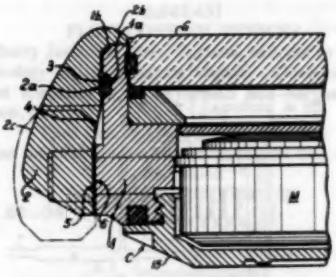
3,643,423

## PROTECTIVE SCREEN FOR A TIMEPIECE CASING

Ervin Piquerez, 2854 Bassecourt, Switzerland

Filed Sept. 30, 1969, Ser. No. 862,255
Int. Cl. G04b *37/00*
U.S. Cl. 58—88 R 5 Claims

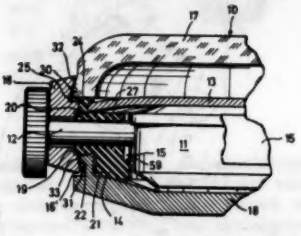


An annular protective jacket of hard scratch-resistant material such as tungsten carbide covers and protects the sidewall and front edge of the casing of a wristwatch. The protective jacket is removably secured in place on the casing by a ring of elastomeric material received in mating annular grooves provided respectively in the sidewall of the casing spaced from the front edge and in the inner periphery of the protective jacket. A second elastomeric ring may be provided between the front edge of the casing and an inwardly projecting rim portion of the protective jacket to absorb axial shocks applied to the jacket.

## 3,643,424
## FLUIDTIGHT WATCH

Peter Simon, Schramberg, Germany, assignor to Ronald Bley, Schramberg, Germany

Filed Aug. 19, 1969, Ser. No. 851,276
Claims priority, application Germany, Aug. 19, 1968, P 17 98 081.3
Int. Cl. G04b 37/08
U.S. Cl. 58—90 R 26 Claims

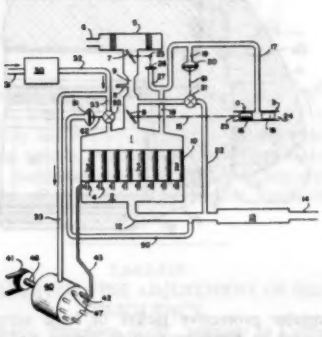


In a watchcase a radially preloaded spring ring urges a soft-elastic packing ring radially outwardly against the inner walls of the case middle and axially outwardly against closure elements to provide a fluidtight watchcase and a floating support for said closure elements as well as for the movement.

## 3,643,425
## LOW-POLLUTING INTERNAL COMBUSTION ENGINE WHEREIN SECONDARY AIR IS INJECTED INTO THE EXHAUST PORTS

Bernhard J. Kraus, Roma-Ostia, Italy, and Dae Sik Kim, Maplewood, N.J., assignors to Esso Research and Engineering Company

Filed Feb. 12, 1970, Ser. No. 10,905
Int. Cl. F01n 3/10
U.S. Cl. 60—30 2 Claims

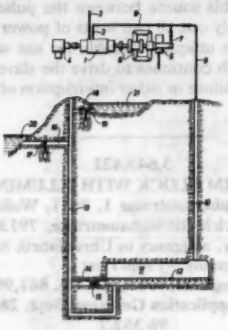


Low-polluting internal combustion engine wherein means are provided to inject secondary air in a pulsed manner to the exhaust ports of the cylinders when the port valves are open to permit the ejection of exhaust gases. Particular features comprise controlling these pulses with respect to the shape of pulse, duration of pulse, and timing of the pulse with the cycle of the engine.

## 3,643,426
## POWERPLANT DRIVEN BY A GAS TURBINE, AND A METHOD OF OPERATING SUCH A POWERPLANT

Ingvar Janelid, Forsetevagen 18, Djursholm, Sweden

Filed June 29, 1970, Ser. No. 50,726
Claims priority, application Sweden, June 30, 1969, 9298/69
Int. Cl. F02c
U.S. Cl. 60—39.02 8 Claims

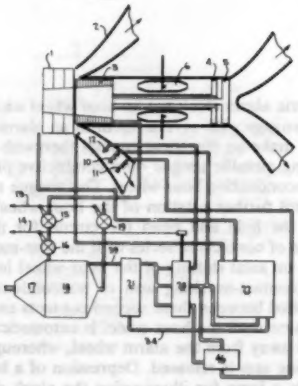


A powerplant is driven by a gas turbine. The compressed air for the gas turbine is accumulated in a rock chamber. The rock chamber communicates through a conduit with a lake, so that the rock chamber can receive water to any desired level. A pump is arranged in said conduit, to assist the flow of water from the lake to the rock chamber, or vice versa.

## 3,643,427
## FUEL CONTROL SYSTEMS FOR SUPPLYING FUEL TO PRIMARY AND MAIN BURNERS IN A GAS TURBINE ENGINE

Owen Napier Lawrence, Boxford, near Newbury, and Eugene Harold Warne, Solihull, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation-in-part of application Ser. No. 624,016, Mar. 17, 1967, now abandoned. This application Aug. 22, 1969, Ser. No. 852,386
Int. Cl. F02c 9/04
U.S. Cl. 60—39.28 4 Claims



Fuel control systems for supplying fuel to the primary and main burners in gas turbine engines of the fan-type in which means are provided for controlling the primary fuel supply in accordance with the engine compressor pressures. A variable

operator control valve is utilized for supplying fuel to the main burner and means are included to maintain the flow rate to the main burners as a function of that of the primary burners.

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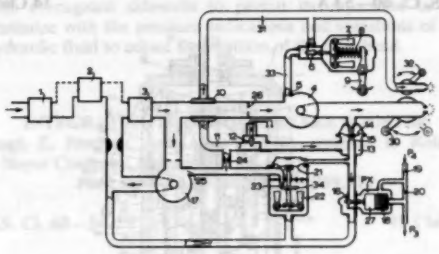
3,643,428

## FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

David Marshall, and Arthur Leslie Lloyd, both of Wolverhampton, England, assignors to H. M. Hobson Limited, London, England

Filed July 24, 1970, Ser. No. 57,944
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 5 Claims



A fuel supply system for a gas turbine engine which comprises a fluidic vortex valve which meters the flow of fuel delivered by a pump to the main burner of the engine, a governor controllable by the pilot which adjusts the pressure of fuel at the control port of the vortex valve to maintain during steady state conditions the engine at a speed determined by the governor, and means operable during periods of acceleration and when the flow through the control port of the metering vortex valve is saturated to vary the pressure drop across the metering vortex valve, as a function of engine speed and compressor pressure, so that the flow of fuel to the engine cannot exceed a limit permissible during acceleration.

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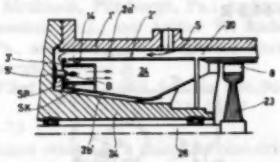
3,643,429

## GAS GENERATOR CONSTRUCTION

Manfred Schutz, Ottobrunn, Germany, assignor to Messerschmitt-Bolk-Blohm GmbH, Munich, Germany

Filed Oct. 24, 1969, Ser. No. 868,997
Claims priority, application Germany, Nov. 16, 1968, P 18 09 348.6
Int. Cl. F02k 9/02
U.S. Cl. 60—39.46 5 Claims



A gas generator construction particularly an auxiliary combustion chamber for a rocket engine of the main current type for the production of oxygen-rich propellant gases of relatively low temperatures includes either a single annular reaction chamber or a plurality of individual side-by-side reaction chambers arranged within an annular combustion chamber which is located to discharge its gases to a rotating turbine. The construction includes means for directing a propellant component in the form of a liquid fuel into the reaction chamber in the form of a spray and for directing the primary oxygen supply through openings surrounding the nozzle for the liquid fuel in order to provide a stoichiometric combustion of the fuel with a part of the oxygen and oxygen carrier in the reaction chamber. The reaction chamber or chambers are of shorter length than the casings for the gas generator and combustion of the fuel with a part of the oxygen supply takes place in the reaction chamber. Secondary oxygen is directed into contact with the walls of the reaction chamber either from the portion of the walls which are located within the auxiliary gas generator or through bores defined along the length of the walls defining the reaction chamber.

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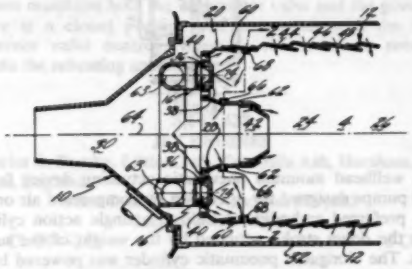
3,643,430

## SMOKE REDUCTION COMBUSTION CHAMBER

John M. G. Emory, Jr., Vernon, and Joseph J. E. Faltani, Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 4, 1970, Ser. No. 16,527
Int. Cl. F02c 7/00
U.S. Cl. 60—39.65 6 Claims



A combustion chamber either an annular or can-annular type, which substantially eliminates the production of smoke while maintaining all other performance parameters of the combustion chamber. The combustion chamber is provided with a front end configuration which substantially eliminates local fuel rich regions and which provides a means for mixing the incoming fuel and air.

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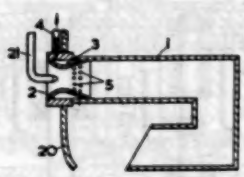
3,643,431

## FLOW CONTROL DEVICES

James Barry Jamieson, Fleet, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 4, 1969, Ser. No. 882,152
Claims priority, application Great Britain, Dec. 6, 1968, 58,178/68
Int. Cl. F02c 3/00; F15d 1/06
U.S. Cl. 60—39.71 9 Claims



In a venturi having a wide angle divergent section, flow separation can occur near the throat resulting in throttling. Suction is applied through perforations in the venturi surface to cause reattachment with consequent increase in flow rate. Air flowing to primary zones in combustion chambers can be

controlled by selective application of suction so as to vary local air/fuel ratios according to operating conditions. A similar arrangement may be applied to fuel injector vaporizing tubes.

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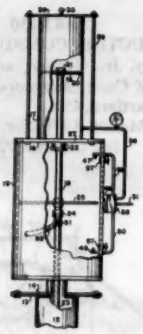
**3,643,432**

**PNEUMATIC PUMP ACTIVATOR FOR OIL WELLS**

Joseph H. Klaeger, 147 Stardream, San Antonio, Tex.

Filed Apr. 23, 1970, Ser. No. 31,158
Int. Cl. F15b *15/18*; F01l *25/08, 25/02*
U.S. Cl. 60—52 PJ 11 Claims



A wellhead mounted pneumatic actuating device for oil well pumps designed for operation by compressed air or gas. The preferred embodiment utilized a single action cylinder with the down stroke actuated by the weight of the sucker rods. The elongated pneumatic cylinder was powered by filtered lubricated compressed air. The pressure or solenoid control floating piston bleeder valve supplies high-pressure air or gas from an external source for lifting the piston and attached sucker rods and the release of pressure from the cylinder accomplishes the down stroke.

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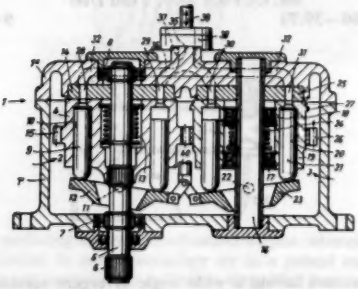
**3,643,433**

**HYDRAULIC APPARATUS WITH INTERCONNECTED HYDRAULIC UNITS**

Dieter Widmaier, Fellbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 7, 1970, Ser. No. 35,427
Claims priority, application Germany, June 10, 1969, P 19 24 010.9
Int. Cl. F16d *31/02*
U.S. Cl. 60—53 A 19 Claims



Two hydraulic units, each operable as a pump or motor, are mechanically connected by a coupling transmission which can be engaged and disengaged. Valves are hydraulically connected to the units, so that a single unit can be operated as a pump or motor, that both units can be simultaneously operated as pumps or motors, and so that the two units form a hydrostatic transmission.

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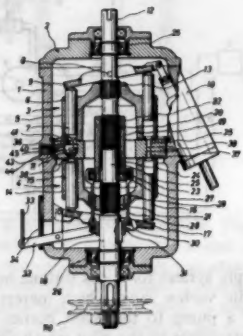
**3,643,434**

**HYDRAULIC APPARATUS WITH AXIALLY ALIGNED HYDRAULIC UNITS**

Dieter Widmaier, Fellbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 8, 1970, Ser. No. 44,329
Claims priority, application Germany, July 23, 1969, P 19 37 347.8
Int. Cl. F16d *31/02*
U.S. Cl. 60—53 A 14 Claims



Two hydraulic units, each operable as a pump or hydraulic motor, have coaxial shafts in end-to-end relationship which can be coupled and disengaged from each other by a coupling. Valve means hydraulically connect the two units, so that a single unit can be operated as a pump or motor, that both units can be simultaneously operated as pumps or motors, and so that the two units can form a hydrostatic transmission in which one unit operates as a pump driven by a prime mover, and the other unit operates as a hydraulic motor.

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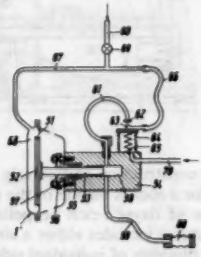
**3,643,435**

**METHOD OF AND APPARATUS FOR ADJUSTING A DEVICE BY FLUID PRESSURE**

Gerhard Klee, Frankfurt am Main, Germany, assignor to Samson Apparatebau A.G., Frankfurt am Main, Germany

Filed Apr. 3, 1969, Ser. No. 813,145
Claims priority, application Germany, Apr. 4, 1968, P 17 52 115.2
Int. Cl. F15b *7/00*; F01b *19/00*
U.S. Cl. 60—54.5 R 7 Claims



A method of controlling a fine adjustment of a part such as a machine tool, for example, by using a stop and using a fluid pressure for indicating desirable changes in the position of the stop, comprises amplifying the signals produced by the

changes in fluid pressure and transforming it into a hydraulic working pressure at a location separate from the means to be adjusted and feeding the working pressure through a connecting line to the adjusting means to effect the adjustment. An apparatus for carrying out the method comprises in its simplest form a diaphragm which is exposed on one side to the changes of fluid pressure in accordance with the adjustment necessary and which is exposed on the other side to a fluid pressure which may be a combination of a pneumatic and hydraulic pressure. The hydraulic pressure is maintained within a cylinder which is closed by a piston member which is connected to the diaphragm. Flexing of the diaphragm causes movement of the piston member to change the pressure in the hydraulic cylinder. The hydraulic cylinder is in turn connected through a line to a semirigid spring tube which forms a stop having a stop head at one end. The spring tube is made with corrugated sidewalls to permit its expansion in accordance with the pressure indications and variations of the hydraulic fluid to adjust the position of the stop head.

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**3,643,436**

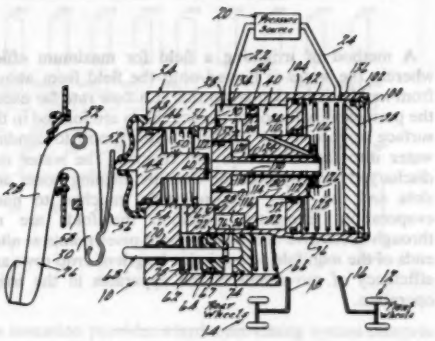
**INTEGRATING HYDRAULIC BRAKE BOOSTER**

**Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Sept. 22, 1969, Ser. No. 859,777**

**Int. Cl. F15b 7/00**

**U.S. Cl. 60—54.6 P** **10 Claims**



A power booster for a brake system in which input force and input displacement hysteresis relative to output pressure is avoided or minimized.

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**3,643,437**

**OVERSPEED PROTECTION SYSTEM FOR A STEAM TURBINE GENERATOR**

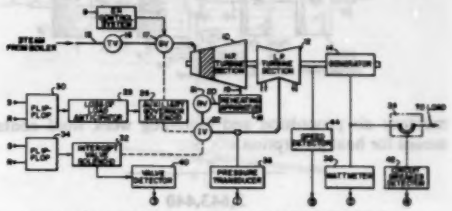
**Manfred E. Birnbaum, Pittsburgh, Pa.; Andrew S. Braytenbah, Pennsauken, N.J., and Arthur W. Richardson, West Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Oct. 16, 1969, Ser. No. 866,965**

**Int. Cl. F01k 13/02, 17/02**

**U.S. Cl. 60—73** **29 Claims**

The disclosure relates to a steam turbine-driven electrical generating plant wherein a protection system is provided for preventing the turbines from reaching speeds which would result in damage to the turbines; such speeds resulting from a sudden partial or entire loss of the electrical load. A partial loss of the load is sensed by a comparison of the inlet pressure at the lower pressure turbine stages with the output power provided to the load. If the output power decreases according to a predetermined relationship and if the input pressure corresponds to a value above a predetermined percentage of rated load, the interceptor valve is closed for a predetermined period of time to stop steam flow between the steam reheating apparatus and the lower turbine stages and thereby to reduce turbine speed buildup during and up to the time that additional load is connected to the generator output. In the event of a total load loss, which is determined in the same manner as in the case of a partial loss of the load but with the additional criteria that the circuit breakers associated with the generator be opened, both the intercept



valve and the main governor valve, which regulates the steam through the high-pressure turbine stages, are closed. Whenever the speed of the turbine generator exceeds a predetermined percentage of rated speed, an overspeed protection system maintains both the interceptor valve and the governor valve in a closed position and cooperates with the main governor valve control system to relieve steam pressure within the reheating apparatus.

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**3,643,438**

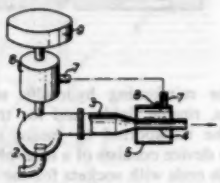
**JET ENGINES**

**Charles R. Barsby, Little Croft, Two Mile Ash, Horsham, Sussex, England**

**Filed Dec. 31, 1969, Ser. No. 889,403**

**Int. Cl. B63h 11/08**

**U.S. Cl. 60—221** **6 Claims**



Liquid pumped at constant velocity through a pipe is injected with an excess quantity of gas under pressure which is thoroughly mixed with the liquid in the pipe to form a small bubble dispersion and the accelerated jet of liquid issuing from the outlet end of the pipe may be used to propel a boat or a land vehicle.

In a jet engine operating on the above principle, a pump driven by a prime mover draws in water from the vicinity of a boat or from a tank mounted on a road vehicle and delivers it under constant pressure through a jet pipe having a perforated section at or near its outlet surrounded by a chamber to which gas under pressure is fed from the exhaust of the prime mover or from a compressor driven by the prime mover and the accelerated jet of water discharged through the pipe outlet produces a propulsive thrust or is employed to drive the wheel of a turbine.

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**3,643,439**

**COMPOUND REACTION PROPULSION MEANS WITH MULTIPLE THRUST**

**Adolphe C. Petersen, 4623 Bruce Avenue, S.E., Minneapolis, Minn.**

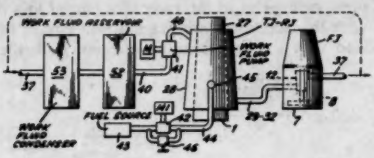
**Filed Nov. 29, 1968, Ser. No. 779,999**

**Int. Cl. F02c 7/20; F02k 11/00; F01k 25/00**

**U.S. Cl. 60—225** **7 Claims**

This power propulsion system involves compound reaction thrust for propulsion, and including supplementary air

propulsion by supplementary propelled airstream impulse, and including pressurized heated work fluid driving supplementary air propulsion and including work fluid container means for heat absorption.

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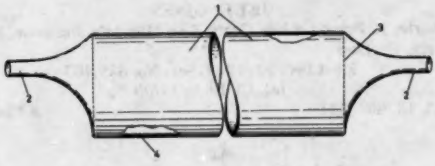
3,643,440

## DEVICE FOR REINFORCING HYDRAULIC STRUCTURES

Gerhard Knisse, Wohltorf; Richard Berger, Dettingen/Teck, and Karl-Heinz Egert, Hamburg, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 15, 1969, Ser. No. 836,679
Claims priority, application Germany, Feb. 28, 1968, K 60 428
Int. Cl. E02b 3/04
U.S. Cl. 61—4 7 Claims



Device for reinforcing hydraulic structures, especially dams, groins, rinsing fields, and for transporting materials which can be transported by means of pumps or similar devices. The device consists of a hose of plastic material provided at both ends with sockets for the inlet and outlet of a sand-in-water mixture and having a length which corresponds to a multiple of its diameter.

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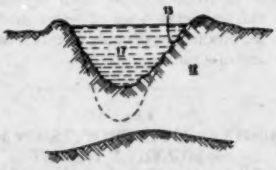
3,643,441

## OIL STORAGE METHOD

Richard S. Hague, Boulder City, Nev., assignor to The United States of America as represented by the Atomic Energy Commission

Filed May 5, 1970, Ser. No. 34,759
Int. Cl. B65g 5/00
U.S. Cl. 61—.5 1 Claim



Vessels for the storage of liquid, such as crude oil, are formed by detonating a nuclear (or conventional) explosive under the surface of a permafrost area such as occurs in arctic and subarctic regions, to form an open crater. The walls of such a crater are naturally sealed or may be easily sealed liquidtight by the freezing of water in the pore spaces of the host media, whereby oil (or other product) may be stored in the permafrosted crater without seepage loss. Further, permafrost (or frozen moisture between the permafrost and the product to be stored) in the fallback material (rubble) in the crater will form an effective separation barrier between the oil (or other product) and residual radioactivity formed as a result of the nuclear detonation.

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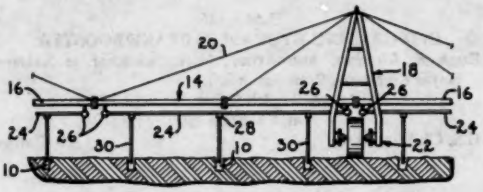
3,643,442

## AGRICULTURE IRRIGATING METHOD

Richard K. Houston, Kansas City, Mo., assignor to Agrecology, Incorporated, Kansas City, Mo.

Continuation-in-part of application Ser. No. 697,980, Jan. 15, 1968, now abandoned. This application Feb. 25, 1970, Ser. No. 13,975
Int. Cl. E02b 13/00; B05b 3/00
U.S. Cl. 61—12 5 Claims




A method of irrigating a field for maximum efficiency wherein the water is flowed onto the field from above and from mobile irrigation apparatus at a flow rate far exceeding the permeability factor of the soil. Slots are formed in the soil surface to receive the inherent water runoff to conduct the water into the subsurface soil regions. The water may be discharged directly into the slots by aligning hoses and the slots and the latter are preferably mulched to minimize evaporation. Elongated irrigation manifolds are moved through successive arcs swung about pivot points at alternate ends of the manifold to maximize length of crop rows and the efficiency of movement of the apparatus in the irrigation operation.

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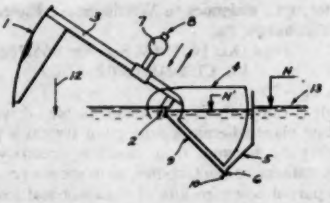
3,643,443

## AUTOMATIC CONSTANT DOWNSTREAM LEVEL GATE

Philippe Alexandre, La Trouche, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Grenoble, France

Filed Dec. 29, 1970, Ser. No. 102,286
Claims priority, application France, Jan. 5, 1970, 7000464
Int. Cl. E02b 7/52
U.S. Cl. 61—22 2 Claims



The control gate herein embodies a sector float immersed in a container which is in communication with the tailrace through an opening formed between the lower end of the downstream wall of the container and its base which projects downstream beyond such opening to shelter the latter from the tailrace current.

3,643,444

## SURFACE STABILIZATION PROCESS

Stamford Hodgson, Penarth, Wales, assignor to BP Chemicals Limited, London, England

Filed Aug. 11, 1970, Ser. No. 63,016
Claims priority, application Great Britain, Aug. 20, 1969, 41,642/69
Int. Cl. E02d 3/14
U.S. Cl. 61—36 R 8 Claims

Ground surfaces such as oil storage bund areas are protected from seepage of hydrocarbon liquids by coating the surface with a plasticized polyvinyl acetate latex prepared in the presence of a partially hydrolyzed polyvinyl acetate homopolymer. In a prepared aspect, excessive layers of finely divided mineral materials bound together with latex are put down, and the whole sealed by a surface dressing of latex.

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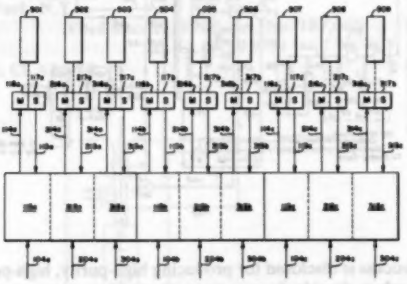
3,643,445

## HYDRAULIC CASING SYSTEMS IN MINE WORKINGS

Helmut Schmidt, Essen-Haarzopf, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed June 12, 1968, Ser. No. 736,487
Claims priority, application Germany, June 14, 1967, P 15 33 723.2
Int. Cl. E21c 35/24; F15b 11/16, 13/06
U.S. Cl. 61—45 D 6 Claims



This invention provides a hydraulic casing system comprising automatically advancing casing structures which are connected together in groups in such fashion that in each group only one casing structure can move at once, although several casing structures in different groups can move at the same time, the casing structures being allocated individual control systems which are prepared for the advancing movement, or are locked, by elements which sense a freedom to advance, in particular by sensing elements which cooperate with the roof or sill of the seam or working, and is characterized by the fact that the individual control systems are incorporated in a logic system governing the selective advance of the different groups.

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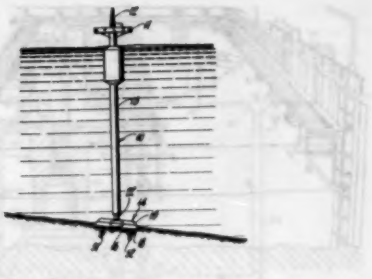
3,643,446

## MARINE PLATFORM FOUNDATION MEMBER

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 25,943
Int. Cl. E02b 17/00; E02d 27/04
U.S. Cl. 61—46.5 8 Claims

The invention relates to an anchor or foundation member for positioning a buoyant platform at an offshore location characterized by a sloping or irregular floor surface. The anchor includes initially separable members which are floated to an operating or anchoring site. A coupling member depending from the anchor is adapted to engage the lower end of the elongated, buoyant structure for retaining the latter in place at the water's surface. The coupling member is adjusted into vertical alignment with a connector depending downwardly from the marine structure. While being held in



the upwardly aligned position by an enclosing retainer, a hardenable fluid such as cement is introduced to solidify and form the coupling and retainer member into a singular body.

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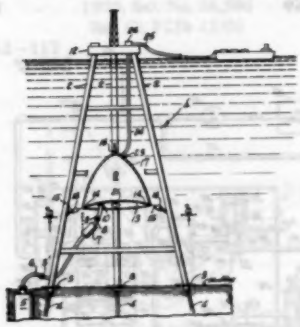
3,643,447

## FLEXIBLE STORAGE CONTAINER FOR OFFSHORE FACILITY

Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,241
Int. Cl. E02d 29/00; B63b 35/44
U.S. Cl. 61—46 7 Claims



A submergible flexible storage container for storing crude product anchored to columns beneath an offshore drilling and production platform or similar support structure. The container includes inlet and outlet means for receiving crude product and for disposing of crude product to a floating vessel. A manhole opening is also provided for ingress and egress of personnel in removing extraneous matter collected in the base of the flexible storage container.

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3,643,448

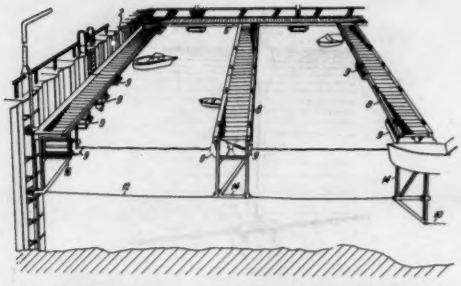
## FLOATING LANDING STAGES

Walter Bower, Newark, England, assignor to Thos. Storey (Engineers) Limited, London, England

Filed Apr. 21, 1970, Ser. No. 30,419
Claims priority, application Great Britain, Apr. 24, 1969, 20,976/69
Int. Cl. E02b 3/20; E02c 5/02
U.S. Cl. 61—48 4 Claims

A floating landing stage including a plurality of floating jetties the free ends of adjacent jetties being interconnected by ties which prevent any substantial movement of the jetties relative to each other or to the remainder of the landing stage and which are located beneath the surface of the water

so as to allow passage of craft between the jetties. Guide means is provided to restrain the movement of the landing



stage relative to the shore so that the landing stage can rise and fall with the water in which it is floating without any substantial lateral movement.

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3,643,449

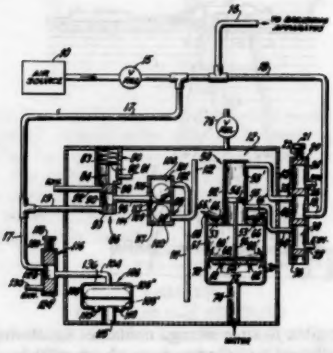
## VARIABLE BUOYANCY ARRANGEMENT

Robert H. Murphy, West Hartford, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Continuation-in-part of application Ser. No. 767,373, Oct. 14, 1968, now Patent No. 3,572,048, dated Mar. 23, 1971, Continuation-in-part of application Ser. No. 766,932, Oct. 11, 1968, now Patent No. 3,541,985, dated Nov. 24, 1970. This application Sept. 2, 1969, Ser. No. 854,699

Int. Cl. B63c *11/22*

U.S. Cl. 61—69 13 Claims



A variable buoyancy arrangement includes a tank of fixed volume and pressure-regulating apparatus for maintaining the interior of the tank within a fixed pressure range above the ambient underwater condition. An air pressure actuated pump is selectively operable under user control for decreasing buoyancy by inserting water into the tank; and buoyancy may be increased by opening a stop valve to expel water from the tank.

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3,643,450

## PROTECTING A BURIED MATERIAL SUCH AS A CABLE WITH WATER-SOLUBLE RODENT-REPELLENT COMPOSITIONS

Roy E. Stansbury, and James A. Shotton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 25, 1969, Ser. No. 861,175

Int. Cl. F16l *1/00*

U.S. Cl. 61—72.1 7 Claims

A water-soluble rodent-repellent composition is coated onto a material, e.g., a cable, which is laid into the ground. Ground moisture dissolves the composition, forming in the earth surrounding the cable a rodent-repellent barrier thus preventing contact of the rodent with the cable or material. Any rodent repellent in a water-soluble or water-dispersible composition can be used. Specifically mentioned in the disclosure as now-preferred effective rodent repellents are N,N-dialkyl sulfenyl dithiocarbamates, e.g., the N,N-dimethylsulfenyl dithiocarbamates, N,N-dimethyl-S-methylsulfenyl dithiocarbamate and N,N-dimethyl-S-tert-butylsulfenyl dithiocarbamate.

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3,643,451

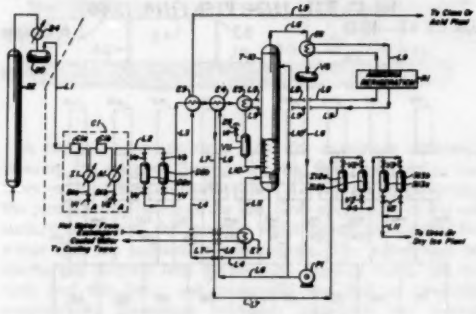
## METHOD FOR THE PRODUCTION OF HIGH-PURITY, HIGH-PRESSURE CARBON DIOXIDE FROM A MIXTURE OF LOW-PRESSURE MIXED ACIDIC GAS

Harry G. Foucar, Shaler Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed Aug. 18, 1969, Ser. No. 850,852

Int. Cl. F25j *3/02*

U.S. Cl. 62—28 13 Claims



A process is disclosed for producing high-purity, high-pressure carbon dioxide from a concentrated low-pressure mixture of acid gases including one or more sulfur-containing gaseous compounds, and carbon dioxide as the major gas in the mixture with the highest vapor pressure, the mixture containing less than 1 percent of nonacid gases. The process including the steps of: compressing the mixture of acid gases, cooling the mixture of acid gases to liquefy the mixture of acid gases, fractionating the mixture of liquefied acid gases into a high-purity carbon dioxide liquid overhead of about 99.95 percent and a liquid bottom of condensed sulfur compounds, and vaporizing the carbon dioxide liquid overhead in heat exchange relationship with the mixture of acid gases during the cooling thereof.

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3,643,452

## RECOVERY OF GASES

Martin Siegfried William Ruhemann, Brooklands, and Stanley Mercer, Manchester, both of England, assignors to Petrocarbon Developments Limited, Manchester, England

Filed Aug. 20, 1969, Ser. No. 851,705

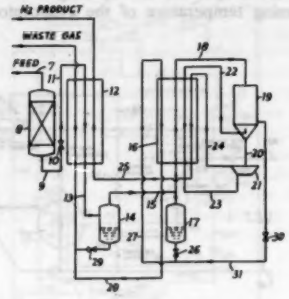
Claims priority, application Great Britain, Aug. 20, 1968, 39,734/68

Int. Cl. F25j *3/00, 3/08*

U.S. Cl. 62—22 9 Claims

A light gas, namely hydrogen or helium, of increased purity is obtained from a gaseous mixture consisting predominantly of the light gas by passing the mixture through a rotating gas centrifuge under conditions such that gaseous impurities are condensed and a light gas stream of increased purity is recovered. The process may be applied to a light gas concentrate obtained from a gaseous mixture by separation of

the constituents other than the light gas by low-temperature condensation, in which case a gas expansion turbine used to



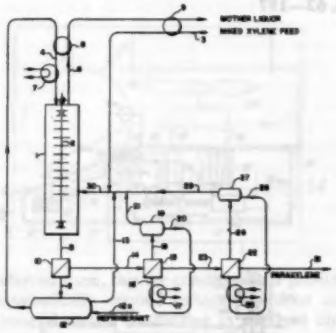

produce refrigeration for the process may be used to drive the gas centrifuge.

3,643,453

## SELECTIVE CRYSTALLIZATION OF PARAXYLENE IN A WATER-ALKANOL MIXTURE

Hendrik Groothuis, and Jan G. van de Vusse, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 787,063
Int. Cl. B01d 9/04
U.S. Cl. 62—58 6 Claims



Selective crystallization of paraxylene from a liquid mixture by direct contact with a cooled, immiscible, liquid refrigerant consisting of alkanol, water and a surface active agent which refrigerant wets the paraxylene crystals preferentially and has a low-interfacial tension relative to the resulting mother liquor.

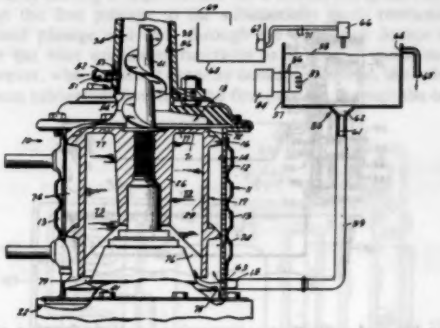
3,643,454

## WATER SYSTEM FOR AN ICEMAKING APPARATUS

Phillip H. Turner, Inver Grove Heights, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 22, 1970, Ser. No. 39,774
Int. Cl. F25c 1/14
U.S. Cl. 62—66 9 Claims

A method and means for producing ice by gravitationally feeding water from a source of supply in excess of the freezing capacity of a refrigerated cylinder, wherein the feed water is directed into a lower part of the cylinder and the excess feed water is vented through a drain located in a compression nozzle above the level of the cylinder. The water is circulated through openings formed in the top of a harvesting auger. The water flow aids in lifting harvested ice product



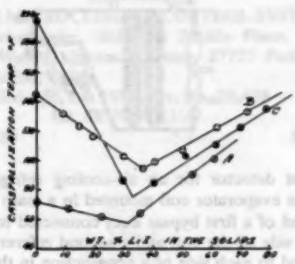
and also serves to thaw out the unit and prevent it from becoming ice bound.

3,643,455

## COMPOSITIONS FOR ABSORPTION REFRIGERATION SYSTEM

William E. Hensel, Jr., Powell, Ohio, and William W. Harlowe, Jr., San Antonio, Tex., assignors to Arkla Industries, Inc., Evansville, Ind.

Original application Jan. 3, 1968, Ser. No. 695,523, now Patent No. 3,524,815. Divided and this application July 20, 1970, Ser. No. 56,580
Int. Cl. F25b 15/06
U.S. Cl. 62—112 2 Claims



Aqueous solutions of LiI-LiBr containing up to about 50 weight percent LiI based on total salt are used as the refrigerant-absorbent in an air-cooled, two-pressure absorption refrigeration system. The crystallization temperatures of these solutions are sufficiently low that crystal formation will not occur when the temperature of the solution drops to ordinarily expected ambient temperatures of, for example, 100° F. Further depression of the crystallization temperature is obtained by adding ethylene glycol or glycerine to the mixed salt solution.

3,643,456

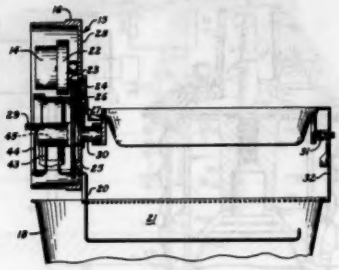
## MECHANICAL BIN-LEVEL-SENSING CONTROL FOR DOMESTIC ICE MAKER

Duane C. Nichols, Evansville, Ind., assignor to Whirlpool Corporation

Filed June 17, 1970, Ser. No. 46,920
Int. Cl. F25c 5/18
U.S. Cl. 62—137 12 Claims

An ice body maker having means permitting the drive motor to run continuously while interrupting the operation of

the mechanism when collected ice bodies reach a preselected level. A sensing means is provided which includes means for cyclically ascertaining the quantity of ice bodies in a collecting bin and permitting a successive ice body forming cycle only in the event that the level is below the preselected level. The cycle of operation of the mechanism comprises a timed cycle under the control of the drive motor.



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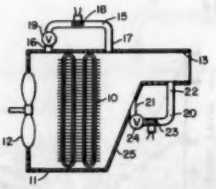
3,643,457

**FROST DETECTOR FOR REFRIGERATION SYSTEM**

Charles L. Winkler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1970, Ser. No. 91,299
Int. Cl. F25d *21/02*
U.S. Cl. 62—140 4 Claims



A frost detector for an air-cooling refrigeration system having an evaporator coil mounted in a main airflow duct is comprised of a first bypass duct connected to the main duct on each side of the coil and a second reference bypass duct connected to each side of a constriction in the outlet side of the main duct downstream from the coil. Signals from airflow velocity sensing devices in each bypass duct are compared to provide a defrost initiation signal to the refrigeration apparatus and the preferred airflow velocity sensing device is an air-cooled electrical resistor connected in a bridge circuit.

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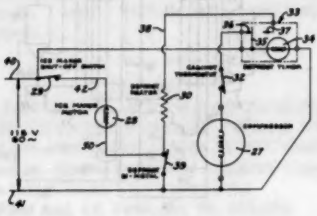
3,643,458

**DEFROST BIMETAL FOR INTERRUPTING TIMED CYCLE ICEMAKER DURING DEFROST—TWO TIMERS**

William J. Linstromgerg, and Duane C. Nichols, both of Evansville, Ind., assignors to Whirlpool Corporation

Filed June 18, 1970, Ser. No. 47,521
Int. Cl. F25d *21/00*
U.S. Cl. 62—155 4 Claims

A refrigerator-freezer apparatus normally operating through freezing and defrosting portions of an operating cycle including a freezer compartment, a refrigeration system including a compressor and an evaporator for chilling the compartment to a subfreezing temperature, an icemaker producing ice bodies and having a motor for timing the period between harvests and for harvesting the ice bodies, an energizable defrost means for periodically warming the evaporator to defrosting temperature, an electrical circuit including the defrost means, an icemaker circuit including the icemaker motor and a temperature responsive switch common to both of these circuits and in heat exchange relationship with the evaporator for opening both circuits at an above freezing temperature of the evaporator so that the temperature responsive switch serves to terminate defrosting when the evaporator attains a substantially frost-free condition and to inactivate the icemaker motor also at above freezing temperatures in order to interrupt the timing function and avoid dumping water from the icemaker into the freezer compartment.



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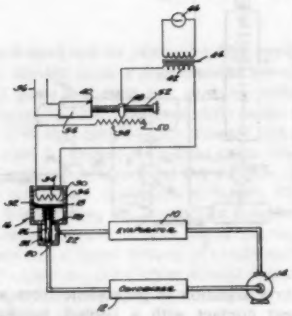
3,643,459

**TIMER-CONTROLLED REFRIGERATION SYSTEM**

Alan A. Matthies, Milwaukee, Wis., assignor to Controls Company of America, Melrose Park, Ill.

Filed Mar. 30, 1970, Ser. No. 23,913
Int. Cl. F25b *41/04*
U.S. Cl. 62—157 8 Claims



An expansion valve in a refrigeration system has an electrically energized operator assembly which controls the operative state of the valve on the basis of the electrical input to the operator assembly. The electrical input to the operator assembly is timer controlled and the system is taken through a preselected refrigeration cycle under control of the timer.

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3,643,460

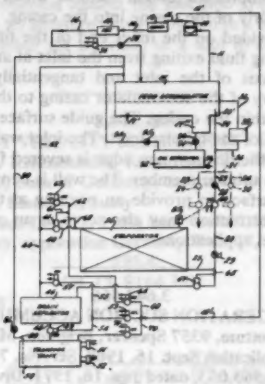
**GRAVITY REFRIGERANT RECIRCULATION**

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Sept. 11, 1970, Ser. No. 71,487
Int. Cl. F25b *41/00*
U.S. Cl. 62—174 6 Claims

A feed accumulator receives liquid refrigerant from the receiver and feeds it by gravity to the evaporator. Excess

liquid refrigerant from the evaporator is temporarily stored in a lower level tank from which it is, from time to time, forced



back to the accumulator by high-pressure refrigerant. Automatic controls and oil separator features are included.

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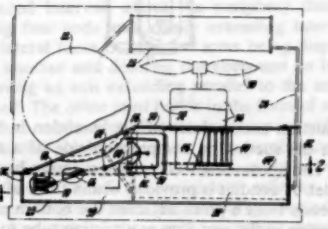
**3,643,461**

**AIR CONDITIONER WITH CYCLING FRESH AIR PERIODS**

**James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 24, 1970, Ser. No. 31,512**
**Int. Cl. F25d** *17/00*
**U.S. Cl. 62—180** **2 Claims**



In the preferred form, this air conditioner is provided with an electromagnetically opened exhaust air door energized through a bimetal switch connecting in different circuit arrangements to either the portion of the compressor motor circuit controlled by the air conditioner thermostat or the uncontrolled portion to provide periodic opening of the door during either the idle period and the running period or the running period alone or the idle period alone or only at the start of the running period of the compressor.

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**ERRATUM**

For Class 62—196 see:
Patent No. 3,643,754

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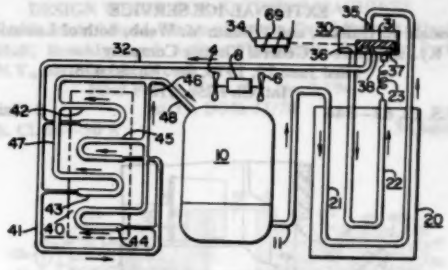
**3,643,462**

**VARIABLE CAPACITY REFRIGERATION SYSTEM AND CONTROLS**

**Arthur H. Eberhart, Hilliard, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 18, 1970, Ser. No. 73,544**
**Int. Cl. F25b** *41/00*
**U.S. Cl. 62—196** **8 Claims**

A refrigeration system for a room air conditioner having an outside heat exchanger with two separate refrigerant flow passages connected either directly or through an expansion device as controlled by a reversing valve. One of the passages is substantially more restrictive than the other. The reversing valve is responsive to the room temperature so that when full capacity cooling is required, the valve directs refrigerant flow from the first passage to the substantially more restrictive second passage and then through the expansion device so that the heat exchanger functions as a normal condenser; however, when reduced capacity cooling is desired, the valve directs refrigerant flow from the first passage, through the expansion device, then through the second restrictive passage which passage than functions similar to an evaporator and reduces the cooling capacity of the system. Further, with this arrangement, the reduced capacity operation permits a reduction of power for driving the compressor. Controls to stop and start the compressor and to control the valve are also provided along with an evaporator having multiple inlets to prevent freezeup when the system is operated continuously.



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**3,643,463**

**PASSIVE MICROCLIMATE CONTROL SYSTEM**

**Sidney Lee Friedlander, 4613 La Subida Place, Tarzana, Calif., and Walter Vincent Blockley, 27727 Pacific Coast Highway, Malibu, Calif.**

**Filed Apr. 14, 1970, Ser. No. 28,488**
**Int. Cl. F25d** *23/12*
**U.S. Cl. 62—259** **12 Claims**

A microclimate control system is disclosed for controlling the removal of metabolic heat from a person's body. The system comprises a self-contained refrigerant garment worn over a variable insulation garment whose thermal conductance is controlled at will by the wearer. The refrigerant garment comprises a plurality of tubes attached to a network of webbing adapted to fit at least over the upper torso of the wearer. Each tube is filled with water and sealed at 4-inch intervals to form a string of individual water compartments. The water-filled tubes are then frozen to provide a refrigerant having a large thermal capacity. The insulation

garment comprises an open cell foam material sandwiched between two outer layers of airtight material. The outer layers are sealed about the periphery of the garment to make an airtight garment. Vacuum means are provided to evacuate the interior of the garment and gradually reduce the thickness of the insulation layer in order to vary the heat conductance of the garment according to the varying metabolic demands of the user.

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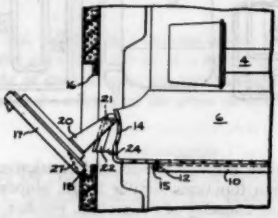
**3,643,464**
**EXTERNAL ICE SERVICE**
**Donald E. Hilliker, and William M. Webb, both of Louisville, Ky., assignors to General Electric Company**
**Filed June 29, 1970, Ser. No. 50,475**
**Int. Cl. F25c *5/18***
**U.S. Cl. 62—344** **8 Claims**



A refrigerator including a freezer compartment, a freezer door having an ice access opening therein normally closed by an ice access door and an ice receptacle slideably supported within the freezer compartment. The ice access door and the receptacle are provided with means for sliding the receptacle forwardly to an accessible position when the ice access door is opened.

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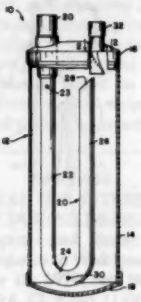
**3,643,465**
**REFRIGERATION SUCTION ACCUMULATOR**
**Edward W. Bottum, 9357 Spencer, Brighton, Mich.**
**Original application Sept. 16, 1968, Ser. No. 759,876, now Patent No. 3,589,395, dated June 27, 1971. Divided and this application Nov. 2, 1970, Ser. No. 85,861**
**Int. Cl. F25b *43/00***
**U.S. Cl. 62—503** **6 Claims**



A suction accumulator is provided for the compressor of a refrigeration system. The accumulator includes a casing having an inlet and an outlet. A U-shaped conduit is provided within the casing. One leg of the conduit extends from a point adjacent the bottom of the casing to the casing outlet. The other leg extends from the casing bottom and terminates in an open end within the casing. A metering opening is provided in the bend of the U-shaped conduit to meter liquid refrigerant into the conduit. The open-ended leg is adapted to receive gaseous refrigerant which passes through the U-shaped conduit and on to the compressor of the system.

The inlet comprises a tubular member which extends from a point exteriorly of the casing into the casing. A fluid guide surface is provided on the inner end of the tubular inlet to direct incoming fluid exiting from the inlet at an angle to the longitudinal axis of the inlet and tangentially around the inner periphery of the accumulator casing to thereby reduce turbulence within the casing. The guide surface is defined by a wall portion of the tubular inlet. The inlet wall is deformed inwardly and the downstream edge is severed from the main portion of the tubular member. The wall is bent onto the opposite wall surface to provide an opening at the guide surface. This construction may also serve as an outlet in some pressure vessel applications.

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**3,643,466**
**REFRIGERATION SUCTION ACCUMULATOR**
**Edward W. Bottum, 9357 Spencer, Brighton, Mich.**
**Original application Sept. 16, 1968, Ser. No. 759,863, now Patent No. 3,563,053, dated Jan. 16, 1971. Divided and this application Nov. 16, 1970, Ser. No. 89,953**
**Int. Cl. F25b *43/00***
**U.S. Cl. 62—503** **3 Claims**

The suction accumulator of the invention is designed for use with the suction or compression side of a refrigeration system. The accumulator comprises a casing having an inlet and outlet. A conduit is provided within the casing. The conduit extends from a point adjacent the bottom of the casing to the casing outlet and acts as a suction tube to draw liquid from the casing and expel it into the casing outlet at a metered rate. A liquid trap chamber is connected to the outlet to receive excessive amounts of liquid expelled from the conduit. The liquid trap chamber is connected exteriorly of the casing.

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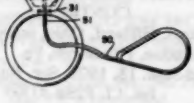
**3,643,467**
**MOUNTING HEAD FOR ARTICLE OF JEWELRY CONTAINING INTERCHANGEABLE ORNAMENTS**
**Edward Postel, 6330 Azalea Lane, Dallas, Tex.**
**Filed May 14, 1969, Ser. No. 824,504**
**Int. Cl. A44c *17/02***
**U.S. Cl. 63—29 R** **3 Claims**



Disclosed is an interchangeable ornament mount for an article of jewelry having a head member defining a plurality of

substantially separately operable pronged sections for gripping a removably inserted ornament inserted therein, a conically shaped spring disposed within said head member urging said ornament against the indented gripping surfaces of the prongs, an aperture being provided in a base portion of said head member for insertion of a tool to eject the ornament.

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**3,643,468**

**CONSTANT VELOCITY SLIDING JOINT COUPLING**

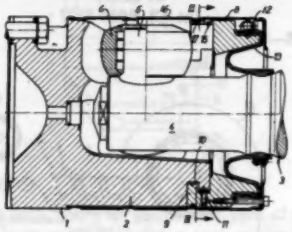
**Hans-Joachim Kleinschmidt, Essen, and Karl-Heinz Teinert, Essen-Steele, both of Germany, assignors to Gelenkwellenbau GmbH, Essen, Germany**

**Filed Dec. 22, 1969, Ser. No. 887,158**

**Claims priority, application Germany, Dec. 27, 1968, P 18 17 195.4**

**Int. Cl. F16d *3/02***

**U.S. Cl. 64—8** **6 Claims**



Constant velocity sliding joint coupling includes one joint half having a plurality of axially extending arms disposed at equally spaced intervals about the periphery thereof, the arms having free ends and axially extending lateral faces, respective lateral faces of adjacent arms being disposed opposite one another and defining therebetween an imaginary cylinder having an axis extending parallel to the axis of the one joint half. The other joint half is in the form of a star and includes a hub, a plurality of stubs or arbors extending radially from the hub, and a respective joint member comprising a central spherical segment having a radius substantially equal to the radius of the imaginary cylinder which is rotatably and longitudinally displaceably mounted on the stubs. The free ends of the axially extending arms are enclosed by a ring member.

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**3,643,469**

**MECHANISM FOR WINDING PHOTOGRAPHIC FILM**

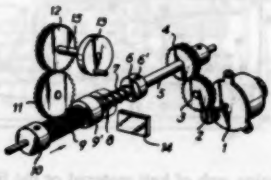
**Nobuaki Enomoto, Okaya-shi, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo, Japan**

**Filed Nov. 4, 1969, Ser. No. 874,000**

**Claims priority, application Japan, Nov. 13, 1968, 43/82515**

**Int. Cl. F16d *3/06***

**U.S. Cl. 64—23** **5 Claims**



A mechanism for winding photographic film in a device such as a camera. The mechanism includes a rotary drive and a transmission for operating a film winder. The transmission includes a friction clutch which is capable of having the degree of friction thereof adjusted. The transmission coacts with the rotary drive for transmitting the drive therefrom to the film winder. In addition, the transmission responds automatically to an increasing load for automatically increasing the friction of the friction clutch, so that in this way the mechanism adapts itself to the size of the load and is capable of absorbing sudden load increases while maintaining a smooth film movement substantially free of any shocks.

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**3,643,470**

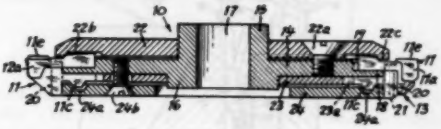
**DESIGN WHEEL FOR KNITTING MACHINES**

**Louis Pernick, Miami, Fla., assignor to David Pernick; David Haft, Brooklyn and Arthur Finkelstein, Rockway Park, N.Y., part interest to each**

**Filed Feb. 6, 1970, Ser. No. 9,194**

**Int. Cl. D04b *15/76***

**U.S. Cl. 66—50 A** **3 Claims**



Needle-driven inclined rotary design wheel having equally spaced replaceable inserted walls extending radially from the periphery thereof wherein the wall inserts extend radially between and within the slots of radially spaced inner and outer circular series of radially extending slots provided in a body portion of the design wheel and wherein the inserted walls provide lateral support for replaceable needle-raising jacks positioned between the inserted walls, the design wheel having a bottom cover plate releaseably secured to the bottom side of the design wheel body portion and serving to releaseably secure the wall inserts therebetween and having a top cover plate releaseably secured to the top side of the design wheel body portion and serving to releaseably secure the jacks therebetween.

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**3,643,471**

**WARP KNITTING MACHINE**

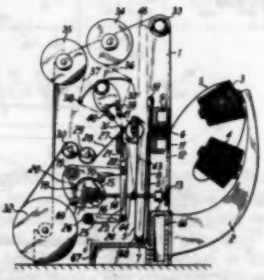
**Stefan Furst, Monchengladbach, Germany, assignor to Walter Reiners, Gladbach, Germany**

**Filed July 9, 1969, Ser. No. 840,161**

**Claims priority, application Germany, July 11, 1968, P 17 60 860.5**

**Int. Cl. D04b *23/12***

**U.S. Cl. 66—84** **8 Claims**



A warp knitting machine having a zone wherein knitting needles are disposed and means for supplying warp threads to the needles includes device for filling a weft having holder members for making the weft ready outside the needle zone,

the holder members being disposed in the vicinity of weft reversal locations and being rotatable in closed travel paths, and means for guiding the weft to the warp threads, the holder members having a thread guide cooperating therewith for making the weft ready, the thread guide being displaceable in the closed travel path of one of the holder members.

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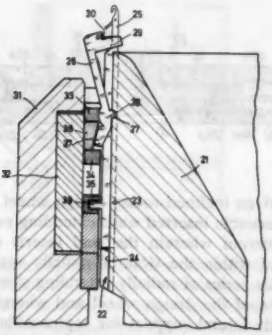
3,643,472

## APPARATUS FOR PRODUCING A LOOPED FABRIC

Harry Apprich, Uhlandweg 34, 7305 Altbach/Neckar, Germany

Filed Aug. 11, 1969, Ser. No. 849,010
Claims priority, application Germany, Aug. 13, 1968, P 17 85 125.1
Int. Cl. D04b *15/06, 15/14*
U.S. Cl. 66—106 11 Claims



The sinkers of a knitting machine are pivotally mounted immediately adjacent their associated needles in a common slot in the needle-guiding structure of the knitting machine. This arrangement can be used in any suitable circular or flat knitting machines. The slots can be formed by means of removable plates, which also act as supports for the sinkers. Camming systems actuate the sinkers and needles. The sinkers can be of various configurations for different functions in the knitting process.

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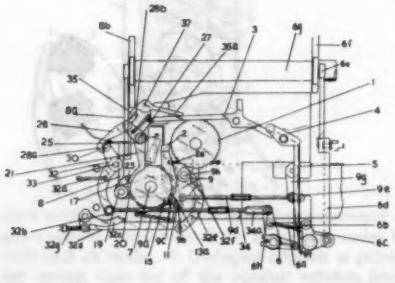
3,643,473

## RACKED PROGRAMMING CONTROL MEANS

Barry Colin Strong, Syston, England, assignor to William Cotton Limited

Filed Nov. 25, 1968, Ser. No. 778,584
Claims priority, application Great Britain, Dec. 6, 1967, 55,518/67
Int. Cl. D04b *15/66*
U.S. Cl. 66—155 8 Claims



Programming control means, primarily for a straight bar knitting machine, having a punched chart racking mechanism racked once per course, auxiliary racking mechanism also racked once per course, indexing mechanism movable with the auxiliary ratchet mechanism, means under control of holes in the punched chart for introducing the auxiliary ratchet mechanism and indexing means, and means under control of the indexing means for rendering the punched chart racking mechanism inoperative for periods governed by the index pitch of the indexing mechanism.

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## ERRATUM

For Class 66—111 see:
Patent No. 3,643,476

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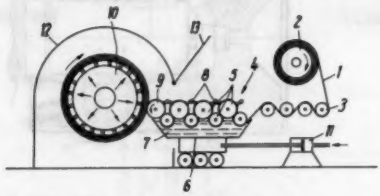
3,643,474

## APPARATUS FOR WET TREATING TEXTILE FABRICS

Gunter Schiffer, Krefeld, Germany, assignor to Joh. Kleinwefers Sohne, Krefeld, Germany

Filed Sept. 21, 1970, Ser. No. 73,763
Claims priority, application Germany, Sept. 22, 1969, P 19 47 858.1
Int. Cl. B05c *8/02*
U.S. Cl. 68—8 8 Claims



An apparatus for wet treating webs of textile material in which the web is passed over and below staggered rollers in a trough adapted to receive treating liquid into which at least some rollers are at least partially immersed while the web material leaving the last roller is wound onto a perforated drum which latter is, relatively to said last roller, pressed against the latter at a substantially uniform pressure during the winding-up operation, said drum being arranged in a housing adapted selectively to be closed completely for independent wet treatment of material on the perforated drum.

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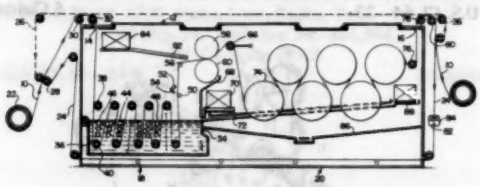
3,643,475

## METHOD AND APPARATUS FOR PROCESSING KNIT GOODS AND THE LIKE

Brooks Stevens, Jr., Concord, Mass., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Filed Dec. 2, 1969, Ser. No. 881,501
Int. Cl. D06f *43/06, 43/08;* B05c *3/132*
U.S. Cl. 68—18 C 7 Claims



A running web of knit material or the like is processed on a continuous basis and in a tensionless open width condition by means of a moving belt, coextensive with the web, which carries the web first through a wet-out stage where it is scoured in a solution or otherwise treated and then to a drying stage. The fabric is carried in tight contact against a plurality of heated rotary drums which cause the entrained

liquid to evaporate from the fabric. A condensate system is provided for condensing and recovering the solution.

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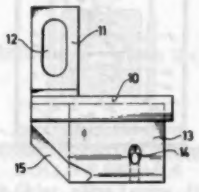
**3,643,476**

## YARN GUIDE FOR CIRCULAR KNITTING MACHINES

**Dieter Overdyck, Ebingen, and Fritz Lehner, Tailfingen, both of Germany, assignors to Mayer & Cie, Tailfingen, Germany**

**Filed Aug. 4, 1969, Ser. No. 862,119**
**Claims priority, application Germany, Aug. 14, 1968, G 67 52 402**
**Int. Cl. D04b *15/08, 15/54***
**U.S. Cl. 66—111** **4 Claims**




A yarn guide particularly for guiding the yarn of a knitting machine. The yarn guide includes a yarn-guiding member formed with at least one passage through which the yarn is guided. This member is composed at least in part of a ceramic material, and preferably it is in the form of a single body of pure ceramic material.

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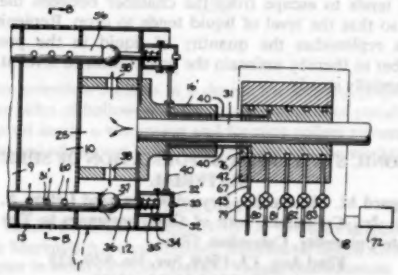
**3,643,477**

## PROGRAMMED CENTRIFUGE DRUM FOR TREATING SHEETLIKE MATERIAL

**Fritz Lorenz, Wattwil, Switzerland, assignor to Heberlein & Co. AG, Wattwil, Switzerland**

**Filed Apr. 18, 1969, Ser. No. 817,344**
**Claims priority, application Switzerland, Apr. 30, 1968, 6441/68**
**Int. Cl. B05c *8/02, 11/122*; D06f *39/00***
**U.S. Cl. 68—150** **10 Claims**



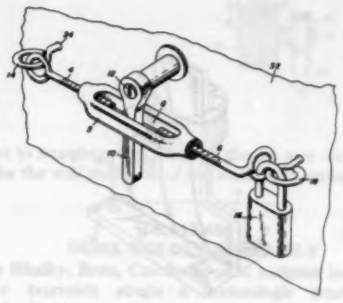
Programmed centrifuge drum to treat thread and sheetlike material wound on the drum according to which selected parts of the material are subjected to treatment fluid passing through areas of the drum jacket according to a desired program; and means for controlling such passage.

**3,643,478**

## SAFETY DOOR LOCKING DEVICE

**John E. McPeake, 3437 West Clearfield Street, Philadelphia, Pa.**

**Continuation-in-part of application Ser. No. 797,383, Feb. 4, 1969, now abandoned. This application June 8, 1970, Ser. No. 44,011**
**Int. Cl. B60r *25/02*; E05c *19/18***
**U.S. Cl. 70—212** **15 Claims**



Unauthorized operation of an exposed latch-operating lever for a door includes bars mounted on the interior of the door to support a pair of eye bolts having their eyes lying on the exterior side of the door. One eye swingably supports an obstruction member such as a turnbuckle and the other eye carries a lock which permits detachable retention of the opposite end of the obstruction member. The elements are positioned so that the obstruction member will prevent movement of the latch-operating lever to a door-releasing position.

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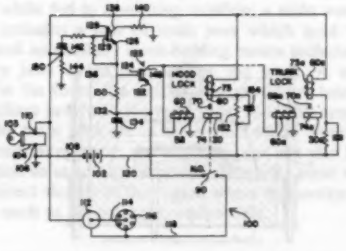
**3,643,479**

## ELECTRONIC HOOD AND TRUNK-LOCKING DEVICE

**Joseph Solow, P.O. Box 116, Plainview, N.Y.**

**Filed May 22, 1970, Ser. No. 39,697**
**Int. Cl. E05b *65/19, 47/02***
**U.S. Cl. 70—241** **9 Claims**




A locking device for an enclosure such as a hood or trunk of an automobile includes a casing having a slidable bolt actuated by a first solenoid and held by a lever in extended position. A second solenoid retracts the lever to permit retraction of the bolt by a spring. A switch in the casing is disposed for operation by the bolt when the bolt is retracted. The first and second solenoids are operable in response to actuation of a key controlled switch and associated electronic circuitry which includes two opposing transistors. The first solenoid is actuated by discharges of a capacitor through one of the transistors when the other transistor is rendered nonconductive.

3,643,480

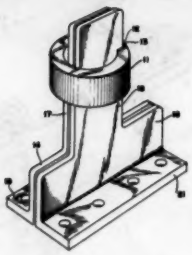
## FORMING COIL

Hansjorg Jansen, La Jolla; Paul Wildi, and James A. Kline, both of San Diego, all of Calif., assignors to Gulf Oil Corporation

Filed Dec. 9, 1968, Ser No. 782,383. The portion of the term of the patent subsequent to Feb. 18, 1986, has been disclaimed.

Int. Cl. B21d 26/14

U.S. Cl. 72—56 7 Claims



Magnetic forming apparatus is described in which a conductive forming coil is formed in a generally cylindrical single turn, and wherein a pair of generally parallel flat conductors are connected to the adjacent ends of the coil and extend axially of the coil.

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3,643,481

## EXPLOSIVE-FORMING DEVICE

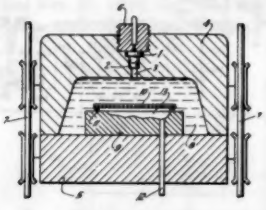
Heinrich Hertel, Tannenbergallee 36, 1 Berlin 19, and Dietrich Ruppin, Berlin, both of Germany, assignors to said Hertel, by said Ruppin

Filed Sept. 24, 1969, Ser. No. 860,703

Claims priority, application Germany, Sept. 25, 1968, P 17 77 207.5

Int. Cl. B21d 26/08

U.S. Cl. 72—56 10 Claims



An explosive-forming device has walls surrounding a pressure chamber arranged to accommodate a workpiece and a die whose surface contour is to be imparted to the workpiece for shock-deformation of the latter into conformance with the surface contour. A recess is provided in the wall means and has an opening communicating with the pressure chamber. A gunpowder charge is accommodated in the recess and fills the same partly. Damping means is arranged in the remainder of the recess intermediate the charge and the opening of the recess and fills at least a part of this remainder of the recess.

3,643,482

## APPARATUS FOR SHOCK DEFORMATION OF WORKPIECES

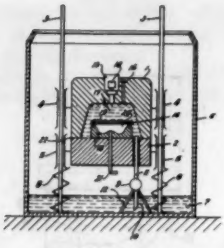
Heinrich Hertel, Tannenbergallee 36, Berlin 19, and Dietrich Ruppin, Berlin, both of Germany, assignors to said Hertel, by said Ruppin

Filed Sept. 24, 1969, Ser. No. 860,704

Claims priority, application Germany, Sept. 24, 1968, P 17 77 208.6

Int. Cl. B21d 26/08

U.S. Cl. 72—56 12 Claims



An apparatus for shock deformation of workpieces comprises a pressure chamber surrounded by at least two walls and arranged to accommodate a workpiece and a die as a surface contour which is to be imparted to the workpiece by shock deformation of the latter into conformance with the surface contour. The walls have respective juxtaposed surfaces and at least one of the walls is movable relative to the other between a chamber-closing position in which the surfaces abut in other-than fluidtight contact and a chamber-opening position. The walls has an inertia so selected as to at least substantially equal the shock pressure necessary for producing the energy level required to obtain the desired deformation of the workpiece so that upon exceeding of the necessary shock pressure relative movement of the walls to the chamber-opening position results with concomitant venting of the chamber. Shock pressure producing means produces a sudden increase in pressure in the chamber. A quantity of pressure-transmitting liquid fills the pressure chamber to a predetermined level and is operative for transmitting shock pressure to the workpiece. Portions of the liquid tends to escape from the chamber between the surfaces so that the level of liquid tends to drop. Replenishing means replenishes the quantity of liquid in the pressure chamber to thereby maintain the predetermined level at least substantially steady.

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3,643,483

## SONIC SYSTEM FOR DEFORMATION OF SHEET MATERIAL

Hildegard M. Minchenko, Reynoldsburg, and Lytton A. Kendall, Jr., Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

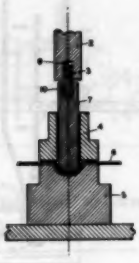
Filed Aug. 13, 1969, Ser. No. 849,823

Int. Cl. B21d 26/02, 22/00

U.S. Cl. 72—56 7 Claims

A system and process for the bending and drawing of metals using vibratory-mechanical energy to facilitate the deformation process. A forming tool or punch is "impact coupled" with the free or unattached end of the transmission line of a piezoelectric electromechanical transducer-transmission line assembly. A mating die is positioned opposite the punch and the metalwork material is inserted

therebetween. Intermittent impacts made by the forming tool against the metal blank effectively transfer dynamic force



and static force sufficient to perform the desired deformation.

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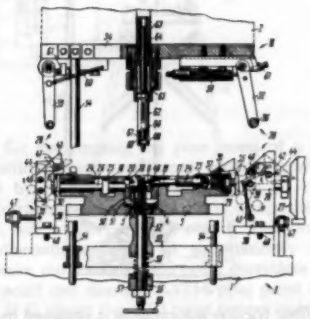
**3,643,484**
**DEVICE FOR FORMING PROJECTIONS ON SIDES OF HOLLOW DETAILS**

Nikolai Nikolaevich Orlov, ulitsa Lenina, 195, kv. 6; Mikhail Shevelevich Leveikin, ulitsa Bikernicku, 63, kv. 13, and Ilmar Alfredovich Pukitis, ulitsa L. Laitsena, 5, kv. 1, all of Riga, U.S.S.R.

Filed Dec. 18, 1969, Ser. No. 886,200
Int. Cl. B21b *1/00*; B21d
U.S. Cl. 72—67 7 Claims



The invention consists in a device for forming projections on the sides of hollow workpieces with the aid of punches introduced inside a workpiece and forming rollers mounted on rotary and advancing heads arranged outside the workpiece.

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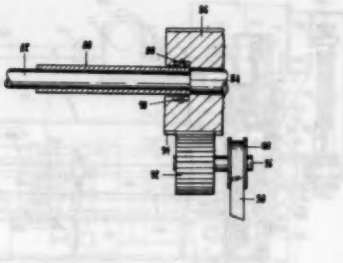
**3,643,485**
**HIGH-PRESSURE ROLLING OF WORKPIECES**

Jacob Marcovitch, Johannesburg, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Continuation of application Ser. No. 634,947, May 1, 1967, now abandoned. This application Dec. 15, 1969, Ser. No. 882,367
Claims priority, application Republic of South Africa, May 5, 1966, 66/2610; Aug. 17, 1966, 66/4911
Int. Cl. B21b *19/08*, *3/06*
U.S. Cl. 72—96 27 Claims

A die for drawing tubular workpieces has its orifice defined by a ring of small rollers which are rotatable to work the workpieces around their circumference. Means may be



present to straighten the tube and the die may include means to make the wall thickness of the workpiece uniform.

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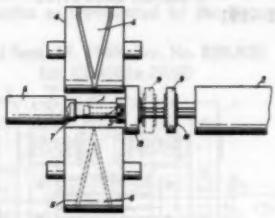
**3,643,486**
**WORK-HOLDING ASSEMBLY**

Vaclav Hladky, Brno, Czechoslovakia, assignor to Vyzkumny ustav tvarecich stroju a technologie tvareni, Brno, Czechoslovakia

Filed Apr. 7, 1969, Ser. No. 813,872
Int. Cl. B21h *9/00*
U.S. Cl. 72—108 3 Claims



In a work-holding assembly wherein a workpiece is supported while fed to a working location, a main work-holding means includes a pair of main jaws which hold the workpiece, and an auxiliary work-holding means includes a pair of auxiliary jaws which also engage the work. A connecting means in the form of a pair of elongated bars interconnects the auxiliary jaws with the main jaws. With this arrangement, while the main jaws are in the region where working of the workpiece takes place, the auxiliary jaws are also located in this region so as to support even a relatively short workpiece in the direct vicinity of the region where it is worked upon by devices such as, for example, wedge-rolls.

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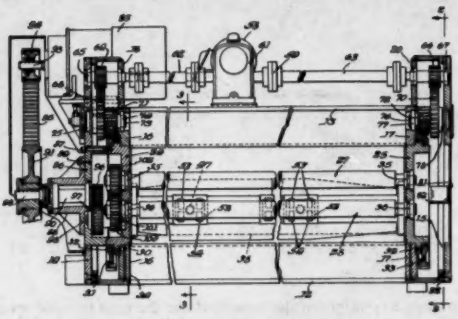
**3,643,487**
**APPARATUS FOR CONTINUOUSLY BENDING AND FLEXING STRIP MATERIAL**

Chester M. Wiig, Lincolnwood, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Jan. 29, 1970, Ser. No. 6,841
Int. Cl. B21d *1/02*
U.S. Cl. 72—164 10 Claims

For cold-working metal strip material, suitably spaced bending and flexing rollers are provided and which are journaled for rotation in end members that form part of a drum type of support. The said support is in turn mounted for rotation since the end members are each rotatably supported in the frame structure of the machine. Thus the rotative posi-

tioning of the drum support will produce various degrees of bending of the strip material as it passes over the rollers



which rotate simultaneously and at the same speed for the said purpose.

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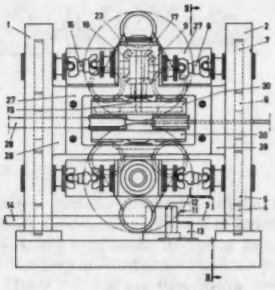
**3,643,488**
**ROLLING MILL**

Erich J. F. E. Bretschneider, Buderich, Germany, assignor to SIEMAG Siegener Maschinenbau GmbH, Dahlbruch, Germany

Filed Dec. 4, 1969, Ser. No. 882,135
Claims priority, application Germany, Dec. 7, 1968, P 18 13 331.8
Int. Cl. B21b *21/00*
U.S. Cl. 72—191 10 Claims



This invention has to do with a universal planetary rolling mill in which clusters of rolls are rotated to swing successive rolls into the path of the stock to be rolled.

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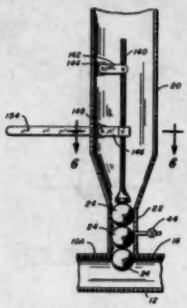
**3,643,489**
**CALIBRATING BARREL**

Billy E. Davis, Tulsa, and Paul V. Gilliam, Broken Arrow, both of Okla., assignors to Signet Controls, Inc., Tulsa, Okla.

Original application June 13, 1968, Ser. No. 736,752, now Patent No. 3,541,837, dated Nov. 24, 1970. Divided and this application Mar. 2, 1970, Ser. No. 15,817
Int. Cl. G01f *25/00*
U.S. Cl. 73—3 8 Claims

Fluid flowmeters are calibrated by comparing the flowmeter through a calibration barrel. The barrel is of uniform internal diameter with two detector switches placed a predetermined distance apart. Balls with a diameter substantially equal to the internal diameter of the barrel move the predetermined distance to actuate the switches so that an exact and predetermined amount of fluid flow is detected. A ball return conduit is connected to the inlet and outlet ends



of the calibration barrel so that a ball is returned from the outlet to the inlet for another calibration test.

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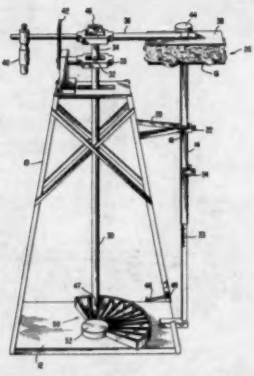
**3,643,490**
**METHOD AND APPARATUS FOR INVESTIGATING INTERFIBER FRICTION**

Kenneth L. Hertel, Knoxville, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Aug. 11, 1967, Ser. No. 660,044
Int. Cl. G01n *3/56, 19/02*
U.S. Cl. 73—9 16 Claims



Interfiber friction information is obtained by measuring the energy dissipated when a fibrous assembly is loaded in shear. The specimen of fibers is mounted between parallel surfaces one of which is connected to a pendulum so as to be oscillated in a direction parallel to the surfaces. During relative oscillatory movement between the surfaces, fibers of the assembly move relative to each other and the work expended in overcoming friction is reflected in the decay in the amplitude of the pendulum oscillations.

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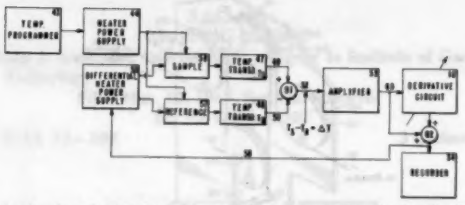
**3,643,491**
**DERIVATIVE DIFFERENTIAL SCANNING MICROCALORIMETER**

Curtis G. Dell; Dennis W. Janzen, both of Newark, Del., and John D. McGhee, Plymouth Meeting, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 11, 1968, Ser. No. 766,857
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 B 6 Claims

A scanning differential microcalorimeter in which energy is differentially supplied to a reference and sample in an ef-

fort to equalize their temperatures. A signal proportional to the difference in energy flows is produced and its derivative




obtained and added to this signal to correct for the lag in the difference signal.

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**3,643,492**

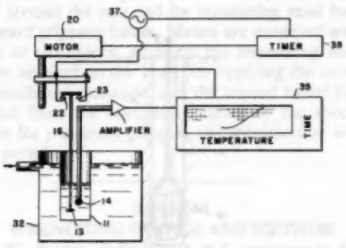
**POUR AND CLOUD POINT ANALYZER**

**Samuel W. Simpson, Florissant, Mo., assignor to Shell Oil Company, New York, N.Y.**

**Filed Apr. 21, 1970, Ser. No. 30,393**

**Int. Cl. G01n *25/04***

**U.S. Cl. 73—17 A** **4 Claims**




Apparatus for determining the pour point of a normally liquid composition having constituents which crystallize upon being cooled by observing the temperature at which the solidifiable constituents in a sample of the composition, upon being cooled, will support a small object. This point is indicated by discontinuance in an automatically recorded time/temperature curve. This solid point correlates with the ASTM solid point and also the ASTM pour point temperature which is 5° F. above the solid point temperature. The inception point of a plateau in the time/temperature curve during the cooling portion of the cycle is the crystal point. This crystal point correlates with the ASTM cloud point. Modification of the apparatus for continuous service can be accomplished by automatically introducing the sample, heating, then cooling, removing the sample and recirculating a fresh sample.

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**3,643,493**

**MEASURING SPECIFIC SURFACE OF POWDERS**

**Jan Vitovsky, Brno, Czechoslovakia, assignor to Vyzkumny ustav Stavebnich lmot, Brno, Czechoslovakia**

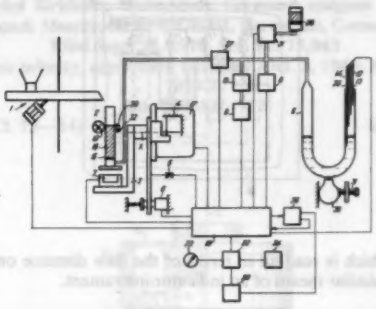
**Filed Mar. 27, 1970, Ser. No. 23,406**

**Claims priority, application Czechoslovakia, Mar. 31, 1969, 2278/69**

**Int. Cl. G01n *15/08***

**U.S. Cl. 73—38** **9 Claims**

Method and apparatus for measuring the specific surface of pulverized materials successively feeding a predetermined weight of pulverized material to a transparent container. The material is then compacted into a predetermined volume and air passed therethrough, the air being increased from an initial pressure to a predetermined increased pressure. The



pressure is then allowed to decrease to its initial position and the time taken is measured against a fixed reference. The process is cyclically and repetitively operated.

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**3,643,494**

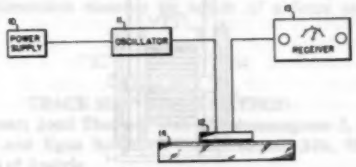
**A NONDESTRUCTIVE MEASURING SYSTEM**

**Erwin W. Kammer, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Sept. 15, 1969, Ser. No. 858,020**

**Int. Cl. G01n *29/00***

**U.S. Cl. 73—67.2** **2 Claims**




A system for nondestructively measuring the thickness of a surface stress layer of a glass material by measuring an increase of the fundamental frequency of a quartz resonator due to the stressed surface layer.

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**3,643,495**

**PROGRAMMED ULTRASONIC PULSE-ECHO APPARATUS FOR FLAW SIZE INDICATION IN MATERIALS TESTING**

**Ludwig Niklas, Lovenich near Cologne, Germany, assignor to Dr. J.U.H. Krautkramer Gesellschaft Fur Elektrophysik, Luxemburger, Germany**

**Filed Mar. 23, 1970, Ser. No. 21,921**

**Claims priority, application Germany, Mar. 28, 1969, P 19 15 833.9**

**Int. Cl. G01n *29/00***

**U.S. Cl. 73—67.9** **8 Claims**

In an ultrasonic pulse-echo apparatus for nondestructive materials testing, particularly for flaw size determination,

flaw size is determined by the reflected echo intensity as analyzed by means of programmable circuit modules the output of which is readout in terms of the flaw distance on the scale or similar means of an indicator instrument.

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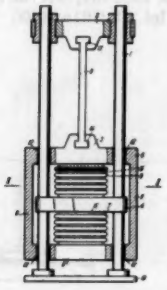
**3,643,496**

**HYDRAULIC LOAD TEST DEVICE**

Vladimir Zajic, Pizen, Czechoslovakia, assignor to Skoda narodni podnick, Pizen, Czechoslovakia

Filed Apr. 3, 1970, Ser. No. 25,416
Claims priority, application Czechoslovakia, Apr. 10, 1969, 2528/69
Int. Cl. G01n *3/10*
U.S. Cl. 73—93 5 Claims



A hydraulic load test device for examination of load test pieces by pull, pressure or bending, provided with hydraulic elastic steel cushions, inserted between crossbeams of a mobile frame arranged slidable along posts and between a crossbeam, connecting both posts of the test device within an opening of the frame.

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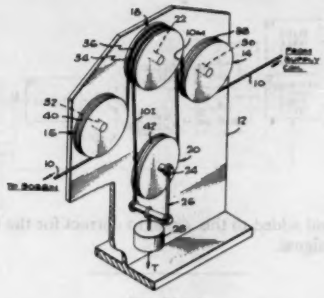
**3,643,497**

**TENSILE LOADING APPARATUS FOR MOVING WIRE**

George W. LeCompte, Rockville, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 1, 1969, Ser. No. 812,971
Int. Cl. G01n *3/28*
U.S. Cl. 73—95.5 11 Claims

Apparatus for testing the tensile strength of moving wire without subjecting wire at the supply coil or other source to high tension, comprising a main pulley with two grooves and a free pulley biased away from the main pulley for leading wire in a loop from one main pulley groove to the other. Guides for guiding wire to and away from the main pulley assure a 180° wire wrap about each main pulley groove. This permits a high-testing tension to exist in the loop that extends about the free pulley, while only a low tension exists prior to entering on the main pulley and after leaving it.



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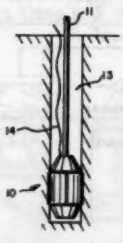
**3,643,498**

**APPARATUS FOR TESTING SOILS IN SITU**

Bobby O. Hardin, 767 Bravington Way, Lexington, Ky.

Filed July 27, 1970, Ser. No. 58,489
Int. Cl. G01n *3/24*
U.S. Cl. 73—101 10 Claims



Apparatus for determining the stiffness of soil in situ includes a compact, sturdy assembly suitable for insertion into a borehole or for use as a penetrometer. An oscillatory portion of the assembly in coupled contact with the soil generates a signal when actuated by a magnet and coil means serving to oscillate that assembly portion in a controlled electrical circuit.

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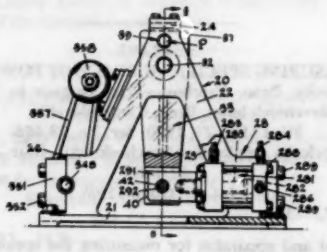
**3,643,499**

**APPARATUS FOR SHEAR AND FATIGUE TESTING OF PINS**

Arthur G. Thayer, Rossford, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 24, 1969, Ser. No. 869,115
Int. Cl. G01n *3/24*, *3/32*
U.S. Cl. 73—101 9 Claims



Apparatus for testing shear pins to determine the most efficient notch design and base composition of metals and metal

alloys from which the pins can be produced by subjecting specimen pins to conditions simulating the actual conditions under which they are to be used.

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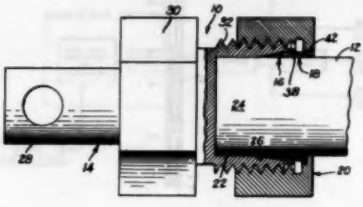
**3,643,500**

## GRIPPING DEVICE

**Philip J. Anderson, Deerfield, Ill., assignor to Institute of Gas Technology**

**Filed Mar. 10, 1969, Ser. No. 805,476**
**Int. Cl. G01n *3/00***
**U.S. Cl. 73—103** **3 Claims**



A device for gripping test specimens or workpieces. The device includes a body having an aperture therein for receiving one end of the specimen or workpiece. Means are mounted around the one end for translating axial forces into radial inward gripping forces. Means are mounted around the specimen or workpiece, adjacent the translating means and removably secured to the body for applying the axial forces to said translating means so that the inward radial forces are transmitted from the translating means to the specimen or workpiece for positively gripping the specimen or workpiece about its periphery.

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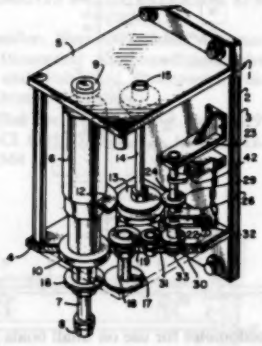
**3,643,501**

## WRENCHING SYSTEM AND METHOD

**Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.**

**Filed Nov. 18, 1969, Ser. No. 877,606**
**Int. Cl. G01l *5/24***
**U.S. Cl. 73—133** **6 Claims**



A wrenching system and method including a wrench for tightening a threaded fastener, measuring the torque placed on the fastener by the wrench, measuring the angle through which the fastener is rotated simultaneously with the measurement of the torque, simultaneously comparing the torque and the rotation angle of the fastener and determining when the rotation angle begins increasing at a nonlinear rate relative to the increase of torque, thereby indicating that the strain on the fastener is exceeding its elastic limit. A signal is created in response to the exceeding of the elastic limit of the fastener, and actuates a shutoff means to stop the wrench.

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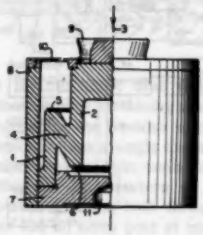
**3,643,502**

## ELECTROMECHANICAL FORCE MEASURING CELL

**Gottfried Birkholtz, Weiterstadt, Germany, assignor to Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany**

**Filed Sept. 24, 1970, Ser. No. 75,042**
**Claims priority, application Germany, Oct. 3, 1969, P 19 49 924.2**
**Int. Cl. G01l *1/22***
**U.S. Cl. 73—141 A** **6 Claims**



Electromechanical force-measuring cell which includes a deformation member formed of two cylindrical tubes of different diameters having a common central axis extending in direction of measurement of a force, one end of each of the tubes being adapted, respectively, to absorb an applied force and a force reactive thereto, a conical tube interconnecting the other ends, respectively, of the tubes, the other ends facing in opposite directions along the common central axis, and force-measuring means comprising a mechanical-to-electrical transducing device disposed at the respective other ends of the cylindrical tubes to which the conical tube is connected, for converting to an electrical signal a deformation produced in the deformation member by action of a force applied thereto.

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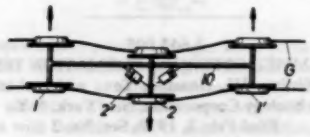
**3,643,503**

## TRACK SURVEYING METHOD

**Franz Plasser; Josef Theurer, both of Johannesgasse 3, 1010 Vienna, and Egon Schubert, Lainzerstrasse 246, Vienna XIII., all of Austria**

**Filed Apr. 7, 1969, Ser. No. 813,854**
**Claims priority, application Austria, Apr. 9, 1968, A3507/68**
**Int. Cl. E01b *35/00***
**U.S. Cl. 73—146** **12 Claims**



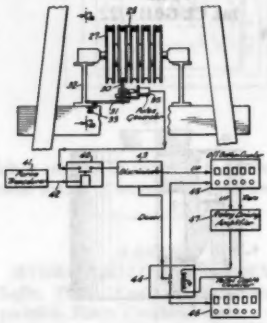
A surveying vehicle is continuously moved on and along a track, the track is subjected to mechanical forces from the continuously moving vehicle, and the change in the track produced by the mechanical forces is measured. Signals corresponding to the measured changes indicate track conditions at successive track points where the mechanical forces have been exerted.

3,643,504

## SYSTEM FOR BOREHOLE DEPTH AND TOOL POSITION MEASUREMENTS

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,057
Int. Cl. E21b 47/00
U.S. Cl. 73—151.5 1 Claim



Disclosed is a method and system for monitoring the depth of a borehole and the distance between the drilling tool and the bottom of the borehole which is usable concurrently with the drilling of the borehole. A rotary pulse generator is provided driven by the slow sheave of the crown block which senses upward and downward movement of the drill string and which provides a pair of pulse train signals representing movement through incremental length segments of predetermined magnitude such as, for example, 1 foot. A discriminator is provided for discriminating between the upward and the downward pulses and for providing a pair of pulse train signals the first representing downward movement and the second representing upward movement, of the drilling tool. The pulses of the first signal are summed by a first pulse counter which in turn provides an output signal representing the accumulated depth of the borehole. A second pulse counter is provided for summing the pulses of the second signal and for subtracting from the resulting sum the pulses of the first signal and for providing a second output signal corresponding to the distance between the drilling tool and the bottom of the borehole. Inhibit means are provided for inhibiting the summing performed by the first counter when the aforementioned second output signal is greater than zero and for inhibiting the subtracting performed by the second counter when the second output signal is not greater than zero. Also, means are provided for inhibiting the operation of both counters when the weight of the drill string is off the drilling cable.

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3,643,505

## PROGRAMMED OFFSHORE FORMATION TESTERS

James W. Kisling, III, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 2
Int. Cl. E21b 47/00
U.S. Cl. 73—155 11 Claims

In accordance with an illustrative embodiment of the present invention, an apparatus is described for making automatic formation evaluation tests in a well bore. To accomplish this, a formation tester is provided with timing means for controlling execution of various predetermined operations, such execution continuing from initiation to termination of the test with no requirement for operator intervention. The invention is of particular utility in an offshore environment wherein the continually changing elevation of the

vessel with respect to the subsea well bore characteristically makes surface control difficult.

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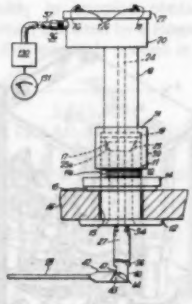
3,643,506

## MARINE SPEEDOMETER

Frederick G. Miles, Ashurst, England, assignor to F. G. Miles Engineering Limited, Sussex and Chetwode Marine Sales Limited, London, England

Filed Dec. 29, 1969, Ser. No. 888,661
Claims priority, application Great Britain, Dec. 31, 1968, 61,945/68
Int. Cl. G01c 21/00
U.S. Cl. 73—186 9 Claims



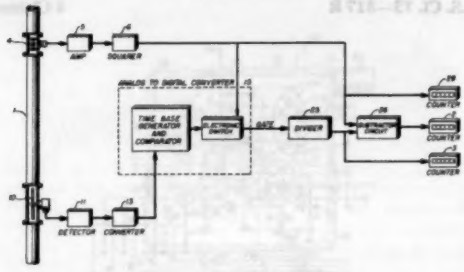
A marine speedometer for use on small boats has a mounting for fitting to the hull of the boat, the mounting projecting through the hull. The mounting supports a vertical shaft the lower end of which carries a wand deflectable against a restoring force by the movement of the water past the boat to turn the wand about the shaft axis to a position dependent on the speed of the boat. The shaft is turned with the wand and is coupled to the wiper of a rheostat located in board of the boat. The rheostat is part of an electrical circuit providing a speed indication. Additionally an integrating circuit may be provided to give a log of distance covered.

3,643,507

## MEANS FOR DETERMINING FLOW RATE AND VOLUME OF A FLOWING FLUID MASS

Sheyrl W. Garrett, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,806
Int. Cl. G01f 1/00
U.S. Cl. 73—194 R 4 Claims



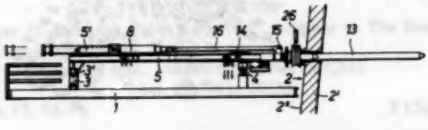

A system which includes a flow meter producing voltage pulses of a frequency proportional to the flow rate of a flowing mass, and a sensing element responsive to a physical condition of the flowing mass with a circuit which produces a DC voltage signal analogous to that condition. A generator provides linear sawtooth voltage pulses against which a comparator circuit compares the analog voltage from the sensing element and circuit. The voltage resultant of the comparison switches a portion of the voltage pulses from the flow meter to a divider circuit element and a subtractor circuit element of the system for conversion of relatively low order changes in the physical condition to their full range equivalents, and for correction of the flow rate or volume as a function of such changes. The flow rate or volume as thus corrected is registered on a suitable flow rate indicator or volume counter.

3,643,508

## DEVICE FOR REMOVING GAS AND FURNACE CHARGE PROBES FROM SHAFT FURNACES AND/OR FOR TAKING TEMPERATURE AND GAS PRESSURE MEASUREMENTS IN THE INTERIOR SPACE OF THE FURNACE

Werner Schneider, Siegen/Westfalen, Germany, assignor to Dango & Dienenthal Kommanditgesellschaft, Siegen am Westfalen and Salzgitter Huttenwerk Aktiengesellschaft Salzgitter, Drutte, Germany

Filed Dec. 15, 1969, Ser. No. 884,971
Int. Cl. G01p 5/16; G01k 1/14; G01n 1/24
U.S. Cl. 73—344 9 Claims



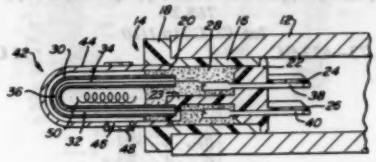

A lance for removing gas and furnace charge probes from shaft furnaces, and in particular from blast furnaces. The lance is also suitable for taking temperature and gas pressure measurements in the interior space of the furnace. The lance is horizontally movably mounted on a platform and is adapted to be inserted into the charge of the furnace via a stuffing box packing and a shutoff gate valve, both of which are arranged in the furnace wall.

3,643,509

## THERMOCOUPLE LANCE

Hubertus Joannes Josephurs Surinx, Kuilenbroekstraat 2, Genk, Belgium

Filed July 7, 1969, Ser. No. 839,361
Claims priority, application Luxembourg, Feb. 4, 1969, 57920
Int. Cl. G01k 13/12
U.S. Cl. 73—354 10 Claims



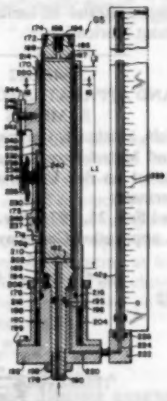

An expendable thermocouple unit facilitates measuring temperature of a molten bath, obtaining a sample of the bath, and facilitates ascertaining the liquidus arrest temperature of the sample. The unit contains a single thermocouple within a cup-shaped container having thin walls and good thermal conductivity so that the temperature of the sample may equalize the temperature of the bath through the container wall. The container has an entry port at one end so that the sample may enter thereinto to remote from the hot junction of the thermocouple.

3,643,510

## FLUID DISPLACEMENT PRESSURE GAUGES

Frederic Lissau, Forest Hills, N.Y., assignor to Liquidonics Inc., Westbury, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,933
Int. Cl. G01l 19/04
U.S. Cl. 73—393 14 Claims



Fluid displacement pressure gauges have pressure responsive elements which displace gauging fluid in readout tubes. Gauging fluid can be located inside or outside the pressure responsive elements. The pressure responsive elements may be capsules with flexible walls or tubular members with flat, curved, corrugated or round walls. Temperature-compensating means and spring rate adjustment means are provided to improve accuracy of reading precision instruments. Hermetically sealed gauges can be used in any position. Readout tubes may have bores of different sizes to improve readout resolution. Differently colored gauging fluids in the readout tubes serve to improve readability. Automatic compensation means may be provided to compensate for variations in fluid volume due to temperature changes. Readout tubes can be provided with means to eliminate parallax in reading scales.

Readout tubes and scales can be coiled to improve readout resolution without increasing overall scale height.

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**3,643,511**

**SAMPLE-INLET VALVE FOR GAS CHROMATOGRAPHS**

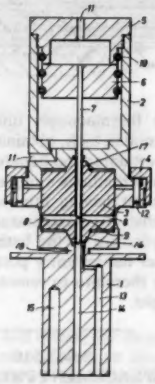
**Heinz Warncke, Cologne, and Melchior Kahl, Leverkusen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Mar. 20, 1970, Ser. No. 21,310**

**Claims priority, application Germany, Apr. 24, 1970, P 19 20 768.2**

**Int. Cl. G01n *1/10***

**U.S. Cl. 73—422 GC** **11 Claims**



A liquid-inlet valve for a gas chromatograph is designed on the principle of a metering rod with a metering groove or bore milled into it, the rod being inserted into a heated evaporator, wherein that part of the valve which is to receive liquid upon loading of the metering groove before insertion into the evaporator, comprises of a solid cylinder of a highly corrosion-resistant material of limited thermal conductivity which seals without lubrication.

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**3,643,512**

**METHOD AND APPARATUS FOR WORKING SOIL SAMPLES**

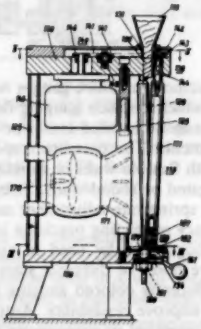
**Hans Muller-Welt, Stuttgart, Germany, assignor to Amtliche Forschungs-und Materialprufungsantalt fur das Bauwesen, Otto-Graf-Institut an der Universitat Stuttgart, Stuttgart, Vaihingen, Germany**

**Filed Feb. 25, 1970, Ser. No. 14,146**

**Claims priority, application Germany, Feb. 24, 1969, P 19 09 609.4**

**Int. Cl. G01n *33/24***

**U.S. Cl. 73—432** **24 Claims**



A method and apparatus for working soil samples to determine characteristics thereof. The soil is formed into a strand which is circular in cross section and the diameter of the strand is progressively reduced until the strand crumbles.

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**3,643,513**

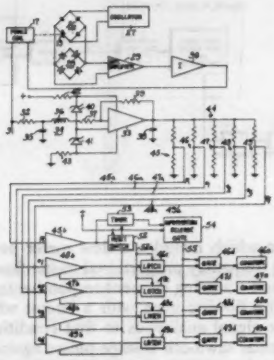
**ACCELEROMETER**

**Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.**

**Filed Aug. 1, 1968, Ser. No. 749,416**

**Int. Cl. G01p *15/08***

**U.S. Cl. 73—517 R** **4 Claims**



An accelerometer for sensing and recording maneuvering acceleration loading of an aircraft where an electrical signal is produced proportional to the loading and the magnitude of the loading above a threshold level is sensed and recorded if the loading is due to maneuvering acceleration.

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**3,643,514**

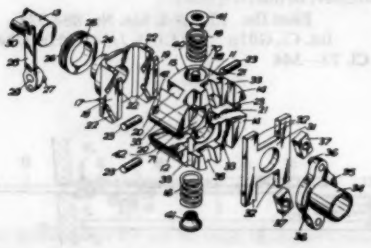
**GOVERNOR DEVICES**

**Frederick William Price, and Derek Williams, both of London, England, assignors to Simms Motor Units Limited, London, England**

**Filed Sept. 16, 1969, Ser. No. 858,440**

**Int. Cl. G05d *13/16***

**U.S. Cl. 73—530** **9 Claims**



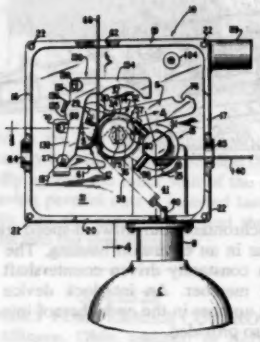
A governor device comprises two rotatably mounted governor weights. An output channel member has inclined slots engaging pins in one face of the weights so that the member is displaced axially when the weights are displaced radially. An output tube is coupled to the weights, for rotation therewith, through abutment members engaging inclined slots in the opposite face of the weights so that the rotational position of the tube is advanced when the weights move radially outwards.

3,643,515

## MULTIOPTION CONTROL HEAD

Arne H. Hansen, New City, N.Y., and Lester Victor Hebenstreit, Bloomfield, N.J., assignors to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Jan. 20, 1970, Ser. No. 4,336
Int. Cl. G05g 17/00
U.S. Cl. 74—2 18 Claims



A valve-operating control head for a fire extinguishing system which can be equipped to be operated by either an electrical, a pneumatic, or a mechanical fire detecting system. The control head mechanism includes a lever centrally mounted on a pivot and carrying a trigger member rotatably mounted on one end thereof. The trigger holds a rotatable spring-loaded valve-operating device against operation by engaging a pin extending from the valve-operating device. A spring extending from the control head casing holds the trigger in engagement with a ratchet wheel carried by the pivot and also tends to rotate the lever and the trigger about the pivot to move the trigger out of engagement with the pin. The trigger is held against rotation about the pivot by either holding the free end of the lever or by holding the ratchet wheel from rotating. When the control head is utilized with an electrical detecting system, a solenoid is positioned to hold the lever and when it is used with a pneumatic system a diaphragm-operated arm holds the lever. When the control head is used with a mechanical detecting system a tensioned cable extending from a fusible link is wound around the ratchet wheel to hold it from rotating.

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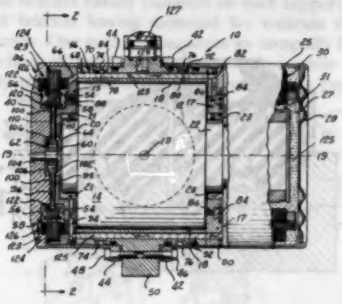
3,643,516

## HYDROSTATICALLY SUPPORTED GYROSCOPE, A COMBINED CENTRIFUGAL AND VISCOUS SHEAR ROTARY PUMP

Oscar D. Jacobson, New York, N.Y., assignor to The Bendix Corporation

Filed Mar. 14, 1969, Ser. No. 807,232
Int. Cl. G01c 19/20
U.S. Cl. 74—5 9 Claims

A combination in a hydrostatically supported gyroscope of a centrifugal and viscous shear rotary pump of a disc impeller type with extremely shallow spiral grooves fabricated in both sides of the disk and in close proximity to smooth stator surfaces so as to cause a high viscous shear in a low-viscosity fluid to effect an improved pressure rise in the spiral grooves as the disk rotates in a sense aiding in a centrifugal pumping action of the impeller disk. In operation, the disk floats hydrodynamically between the stator faces and on a center journal bearing so that there are no wear points during operation of the rotary pump which is particularly adapted



for use in an arrangement for supplying fluid pressure to hydrostatically supported bearings of the gyroscope.

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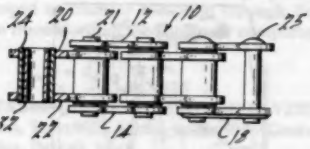
3,643,517

## POWER TRANSMITTING CHAIN WITH FLOATING BUSHING AND METHOD OF MANUFACTURE

William T. Paul, Holyoke, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1970, Ser. No. 85,053
Int. Cl. F16g 13/02
U.S. Cl. 74—254 7 Claims



At least one floating metallic bushing acts as an intermediate bearing member between roller link subassemblies and link pin subassemblies of a power chain. At least one master connection link is held in place by means of a readily disconnectable spring clip. Manufacturing steps include placing a roller link subassembly over open link pin ends of adjacent link pin subassemblies, inserting at least one metallic floating bushing over each pin end and closing each link pin subassembly by fixing link pin members on the open link pin ends of each link pin subassembly.

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3,643,518

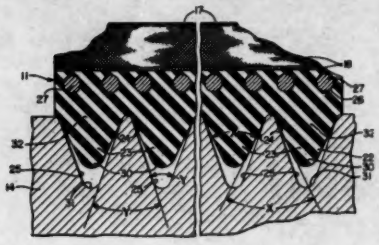
## BELT AND BELT DRIVE ASSEMBLY

Roy E. Semin, and Joseph C. Geist, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 8, 1970, Ser. No. 44,452
Int. Cl. F16g 7/02, 1/22; F16h 5/20
U.S. Cl. 74—219 22 Claims

A flexible power transmission belt used in conjunction with toothed and/or grooved pulleys of a belt drive assembly and capable of driving from opposite portions thereof. The belt includes one driving portion which is preferably transversely toothed to mesh with toothed pulleys and an opposite longitudinal plural V-ribbed driving portion which engages at least one grooved pulley. The belt is particularly useful in belt drive assemblies in which the arc of contact between the

plural V-ribbed driving portion of the belt and the pulley is small or relatively small with the required high tension



materially increasing stresses on the tension member of the belt.

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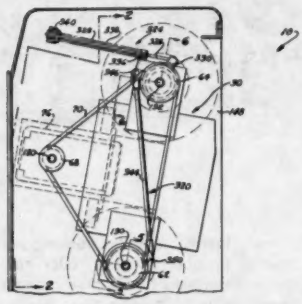
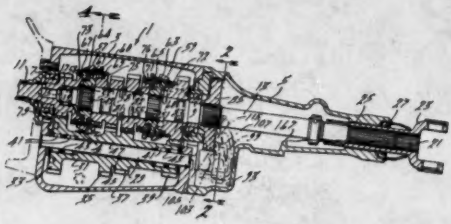
**3,643,519**
**TRANSMISSION ASSEMBLY**
**Robert C. Ebersold, Novelty, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio**
**Filed Apr. 8, 1970, Ser. No. 26,675**
**Int. Cl. F16h** *55/22*
**U.S. Cl. 74—230.17 A** **21 Claims**



An improved transmission assembly includes a pair of variable diameter drive pulleys having effective diameters which can be changed in response to a command signal to vary the speed of rotation of an output member relative to the speed of rotation of an input member. To accomplish this, the command signal effects operation of a reversible servomotor to operate drive assemblies. One of these drive assemblies moves a section of one drive pulley toward another section of the drive pulley to increase the effective diameter of this drive pulley. Operation of the drive assemblies also moves a section of the other drive pulley away from an associated section of the pulley to decrease the effective diameter of this drive pulley. As the sections of the drive pulleys are being moved, a signal generator provides a feedback signal which varies with variations in the effective diameters of the drive pulleys. An error detector interrupts operation of the servomotor when the feedback signal is a predetermined function of the command signal. A belt stretch compensator assembly is provided to increase the effective diameters of both drive pulleys in response to an increase in the effective length of a drivebelt extending between the drive pulleys.

**3,643,520**
**TRANSMISSION**
**Bohdan A. Andrushkiw, Dearborn Heights, and Lynn A. Range, Detroit, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.**
**Filed Apr. 20, 1970, Ser. No. 29,978**
**Int. Cl. F16h** *3/08*
**U.S. Cl. 74—333** **4 Claims**



A fully synchronized four-forward-speed transmission with a reverse gear in an extension housing. The reverse gear is coupled to a constantly driven countershaft by a slideable reverse idler member. An interlock device including two levers having notches in the ends thereof into which pins are movable is also provided.

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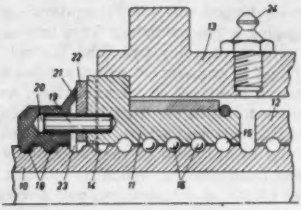
**3,643,521**
**SEALING MEANS FOR A TRANSMISSION MECHANISM**
**Sven Walter Nilsson, Partille, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden**
**Filed Jan. 15, 1970, Ser. No. 3,106**
**Claims priority, application Sweden, Jan. 16, 1969, 521/69**
**Int. Cl. F16h** *55/00;* **F16k** *41/00*
**U.S. Cl. 74—459** **8 Claims**



The nut component of a transmission mechanism is at each end provided with a sealing member designed as a tubular element enclosing the screw of the transmission and having an internal, helical ridge to cooperate therewith. The member is further provided with means for biasing the member away from the nut in such a manner that said ridge will be forced against the sidewall of the groove in the screw remote from the nut, whereby the groove is continuously swept clean as the nut is displaced along the screw. The sealing member is further designed as a reservoir for grease and is equipped to release surplus grease from the nut, when the latter is being filled.

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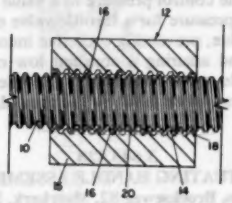
**3,643,522**
**LOW FRICTION BEARING LINER FABRICATION**
**John Peter Fullam, Baie D'Urfee, Montreal, Quebec, Canada, assignor to Abex Industries of Canada, Ltd., St. Laurent, Montreal, Canada**
**Filed Aug. 31, 1970, Ser. No. 68,116**
**Int. Cl. F16h** *1/18, 55/22, 57/04*
**U.S. Cl. 74—424.8 A** **16 Claims**

A low friction nut liner for lining the interior of the nut member of a jackscrew type actuating mechanism. The nut

liner is cut longitudinally into three arcuate segments, one segment being cut along two parallel planes. The three segments are bonded at the interior of the nut member with an epoxy adhesive which contains aluminum particles for improved heat transfer from the liner to the nut member. The




liner is mounted in the nut member by inserting each segment, in turn, axially into the nut member and then moving it radially outwardly against the inner wall of the nut member. The segment having parallel cuts is inserted last by similarly moving it axially into the nut member and then moving it parallel to its cuts into the remaining gap.

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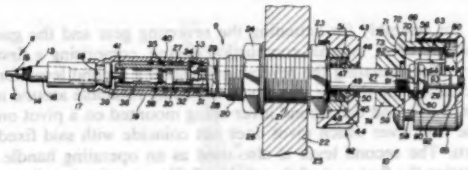
**3,643,523**

**KNOB ASSEMBLY FOR VERNIER CONTROL DEVICE**

**John Mihalla, Alliance, Ohio, assignor to North American Rockwell Corporation, Pittsburgh, Pa.**

**Filed Mar. 30, 1970, Ser. No. 23,846**
**Int. Cl. F16c *1/16***
**U.S. Cl. 74—502** **5 Claims**



A knob assembly particularly adaptable to a control device for moving the core of a push-pull cable with respect to the casing thereof in gross amounts, and, selectively, in accurately fine, or vernier, increments. The control device employs concentric inner and outer members that are rotatable in unison to provide vernier control, but the inner member must first be moved in one direction independently of the outer member and sequentially thereafter the inner and outer members must be moved axially in unison to effect gross control. The knob assembly has a fixed knob means secured to the inner member, and a floating knob means slidably mounted about the outer member. A lever arm is swingingly mounted on a fulcrum carried by the outer member and operatively joins the floating knob means to the inner member in order to effect the required coordination of movement between the inner and outer members in response to the natural application of forces to the knob assembly by an operator.

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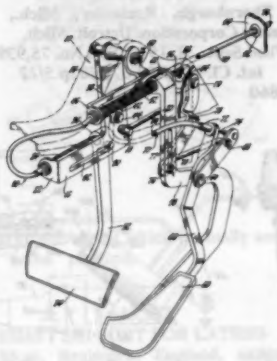
**3,643,524**

**CONTROL PEDALS FOR VEHICLES**

**Lloyd D. Herring, Jenison, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed May 26, 1970, Ser. No. 40,668**
**Int. Cl. G05g *1/14***
**U.S. Cl. 74—512** **6 Claims**

Control pedal apparatus including brake and accelerator pedals adapted for connection with the brake and throttle mechanisms of an automotive vehicle further includes a pivoted brake pedal carrier member suitably swingably mounted on support structure of the vehicle and an accelerator pedal bracket fixedly mounted on such support, each carrier and bracket having mounted for rotation thereon an Acme screw. One such screw carries an integrally formed nut end portion of the brake pedal member while the other rotatably mounts an elongated nut or throttle pedal carrier



member pivotally carrying on a distal end thereof a low-pivoted accelerator pedal member. Linkage between the support structure, the accelerator carrier and the pedal thereon adjusts the vertical attitude of the pedal on the carrier during rotation of the corresponding screw. The accelerator pedal connects with the vehicle throttle through push-pull cable means arranged to transfer actuation through flexure of a loop portion thereof within the passenger compartment.

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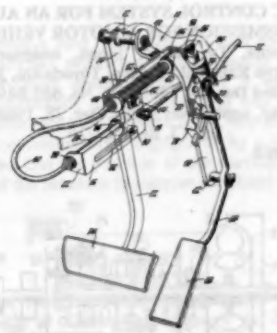
**3,643,525**

**ADJUSTABLE CONTROL PEDALS FOR VEHICLES**

**Jack E. Gibas, Essexville, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed May 26, 1970, Ser. No. 40,669**
**Int. Cl. G05g *1/14***
**U.S. Cl. 74—512** **4 Claims**



An adjustable control pedal apparatus including brake and accelerator pedals adapted for connection with the brake and throttle mechanisms of an automotive vehicle further includes a pivoted brake pedal carrier member suitably swingably mounted on support structure of the vehicle and an accelerator pedal carrier fixedly mounted on such support, each of the carriers having mounted for rotation thereon an Acme screw. One such screw carries an integrally formed nut end portion of the brake pedal member while the

other rotatably mounts an elongated nut member pivotally carrying on a distal end thereof the accelerator pedal member. A tandem cable drive connects the two screws for simultaneous adjusting rotation under operation of a reversible electric motor connected with only one of the screws.

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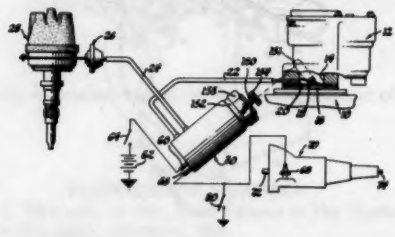
**3,643,526**
**IGNITION TIMING AND THROTTLE POSITION CONTROL**

**William F. Thornburgh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sept. 28, 1970, Ser. No. 75,939**
**Int. Cl. F02d *33/02*; F02p *5/12***
**U.S. Cl. 74—860** **4 Claims**



A solenoid is energized when the transmission is in high-drive ratio and is deenergized when the transmission is in the lower drive ratios or when the engine ignition system is shut off. A valve carried on the solenoid plunger closes the vacuum conduit between the induction passage and the distributor vacuum advance unit when the solenoid is deenergized to prevent vacuum advance during low-drive ratio operation and opens when the transmission is in high-drive ratio to permit vacuum advance during high-drive ratio operation. The solenoid plunger also carries a carburetor throttle stop which prevents closure of the carburetor throttle beyond a relatively fast idle position when the transmission is in high-drive ratio and which permits closure of the carburetor throttle to a relatively slow idle position when the transmission is in low-drive ratio or when the engine ignition system is shut off.

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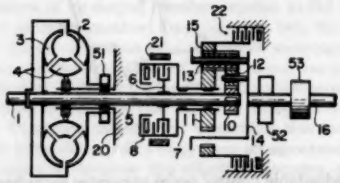
**3,643,527**
**HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION FOR A MOTOR VEHICLE**

**Kiyoshi Ohnuma, Toyoda-shi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda-shi, Japan**

**Filed Dec. 17, 1969, Ser. No. 885,849**
**Claims priority, application Japan, Dec. 28, 1968, 43/95922**
**Int. Cl. B60k *21/10***
**U.S. Cl. 74—868** **4 Claims**



A hydraulic control system for an automatic transmission, having a torque converter or a hydraulic coupler and a servo-operated speed change gear, for use in vehicles, includes a pressure regulator regulating a control hydraulic pressure supplied to the servo-operated speed change gear, and further includes a pressure modulator valve connected to the pressure regulator to assure smooth torque transmission for a large torque demand during low speed operation of the vehicle. A compensating pressure provided by the pressure modulator valve is applied to the pressure regulator valve to assure a control pressure, proportional to the throttle pressure opening or the torque demand, being applied to the servo-operated speed change gear. The pressure modulator valve restricts the control pressure to a value below the maximum constant pressure for a throttle valve opening exceeding a certain value, preventing excessive increase in the control pressure and assuring a constant low control pressure when the vehicle speed increases to a predetermined speed or when the transmission is set for the usual driving range.

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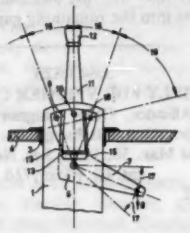
**3,643,528**
**ACTUATING HANDLE ASSEMBLY**

**Jan van der Loos, Broekseweg 82, Meerkerk, Netherlands**

**Filed Mar. 2, 1970, Ser. No. 15,330**
**Int. Cl. B60k *21/00***
**U.S. Cl. 74—876** **8 Claims**



An assembly for actuating the reversing gear and the gas throttle of an internal-combustion engine, comprising a first lever for actuating the reversing gear and a second lever for actuating the throttle, the first lever being rotatable around a fixed axis and the second lever being mounted on a pivot on the first lever which pivot does not coincide with said fixed axis. The second lever is also used as an operating handle. During the first part of the stroke of this operating handle on either side of the neutral position, the extremity of the second lever lying in the vicinity of the fixed axis of the first lever is guided by guiding surfaces in such a manner that both levers substantially move as a unit, but after leaving these surfaces the second lever is independently movable around its pivot and the first lever is blocked in its extreme position.

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**3,643,529**
**FURNITURE CONSTRUCTION**

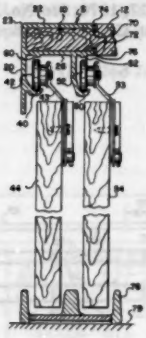
**Joseph P. Bright, 315 Parkway Drive, Berea, Ohio**

**Filed July 17, 1969, Ser. No. 842,536**
**Int. Cl. E05d *13/02*, *15/06***
**U.S. Cl. 16—96** **1 Claim**

Furniture construction including a sliding door support track structure comprising a vertical wall portion having a top flange member extending horizontally outwardly in one direction from its top edge and having an intermediate flange member extending in said one direction outwardly from the wall portion below and parallel to the top flange member. The flange members are spaced from each other to provide a cavity therebetween for receiving the top panel front edge portion of a cabinet. Depending from the intermediate flange member is a hook portion or first track for receiving rollers of a sliding door. The vertical wall portion also has a hook portion or second track formed in such wall portion parallel to the first track for receiving rollers of a second sliding door.

Another form of the invention includes a drawer handle comprising a flat top wall having first, second, and third

flange portions depending therefrom. The first flange portion forms a handle for manual grasping. The second and third



flange portions are spaced from each other to form a cavity therebetween for receiving the top edge portion of a drawer front wall.

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**3,643,530**

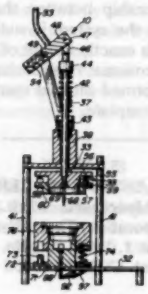
**BUTTON ASSEMBLY APPARATUS**

**Malcolm J. Roebuck, La Salle, Ill., assignor to First National Bank in Peru**

**Filed Aug. 12, 1970, Ser. No. 63,125**

**Int. Cl. A44b *1/06***

**U.S. Cl. 79—5** **11 Claims**



A button assembly apparatus including a die assembly having two die members movable between an open and closed position. The die members include means for applying a covering on a button shell upon closing of the die members. Upon closing the die members a second time, selectively positionable means render the die members suitable for assembling the covered shell to a body member to complete the button.

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**3,643,531**

**MECHANICAL CHECK**

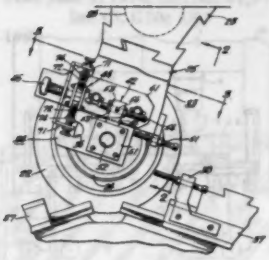
**John E. Burke, Rroomall; Edward J. Kaiser, Philadelphia, both of Pa., and Charles J. Myers, Woodbury, N.J., assignors to J. E. Lonergan Company, Philadelphia, Pa.**

**Filed Nov. 13, 1969, Ser. No. 876,311**

**Int. Cl. B23b *5/36***

**U.S. Cl. 82—11** **9 Claims**

An attachment for a lathe having a turret slide head which mounts a tool for normal movement in a stroke axially towards the chuck, and which may be displaced laterally away from its "home" position at the forward end of its stroke by a pusher mounted on a cross slide of the lathe. This mechanical check retains the tool in its displaced position



against the bias of the spring which normally seeks to return the tool to its "home" position.

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**3,643,532**

**SHAFT SUPPORT FOR LATHES**

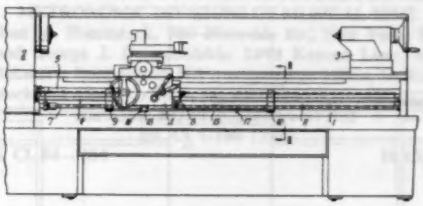
**Eric Frank Moss, Braiswick, England, assignor to The Colchester Lathe Company Limited, Colchester, England**

**Filed May 21, 1970, Ser. No. 39,209**

**Claims priority, application England, May 27, 1969, 26,750/69**

**Int. Cl. B23b *21/00***

**U.S. Cl. 82—27** **5 Claims**



A lathe having a long feed shaft and lead screw in which such long shafts are supported against sagging and whirling by a shaft support assembly including a support beam mounted longitudinally on the lathe bed and two support brackets slidable along the support beam, the brackets being joined by a rod having stops engageable by a projection on the carriage so that the position of the carriage determines the position of the brackets to support the shafts remote from the carriage.

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**3,643,533**

**TURRET LATHE**

**Franz Reiners, Post Berg/Erkelenz-land, and Georg Walk, Rheydt, both of Germany, assignors to A. Monforts, Monchengladbach, Germany**

**Filed Dec. 1, 1969, Ser. No. 881,216**

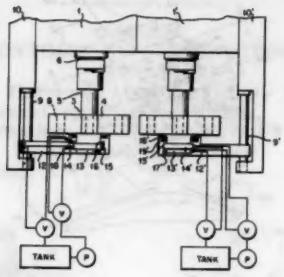
**Claims priority, application Germany, Nov. 30, 1968, P 18 11 958.9**

**Int. Cl. B23b *29/30***

**U.S. Cl. 82—36 A** **4 Claims**

Turret lathe includes a multiarmed tool turret rotatably adjustable to at least two angular positions, and indexing arm carried by the tool turret for indexing the tool turret in each of the angular positions thereof, the indexing arm being

formed with an indexing bore, and an indexing pin continuously extending through the indexing bore for uninterruptedly holding the indexing arm against rotation with the rotatable tool turret.

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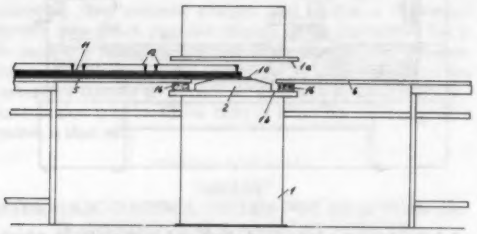
**3,643,534**

**METHOD FOR DIECUTTING SHEET MATERIALS BY MEANS OF A DIECUTTING MACHINE AND A DIECUTTING PLANT FOR THE PERFORMANCE OF THIS METHOD**

**Erik Chresten Jacobsen, Hong, Denmark, assignor to Vilh Pedersen A/S, Hoeng, Denmark**

**Filed Jan. 15, 1970, Ser. No. 7,299**
**Int. Cl. B26d *1/44***
**U.S. Cl. 83—29** **2 Claims**



Die cutting of textiles, plastic foil, plastic fabric, paper and similar materials occurs by means of assembly of cutting dies having cutting edges corresponding to parts to be cut with a bridge diecutting machine including an upper pressure plate movable vertically up and down and including table frames having tabletops that form supporting surfaces for a pad for the material. Part of the supporting surfaces nearest to the diecutting machine has a resilient support and is pressed downwardly by the upper pressure plate of the diecutting machine during the downward stroke of the upper pressure plate. There is a step of placing the cutting die corresponding to the parts separately with their cutting edges facing downwards on the material according to a visually determined arrangement, having regard to the pattern of the material and the degree of the utilization of the material. With respect to that part of the pad which during the operation is outside the active scope of the diecutting machine, together with material and the cutting dies, there is a step of following the pressure plate in the movement of the latter so that the cutting dies within the scope of the pressure plate always lie approximately horizontally.

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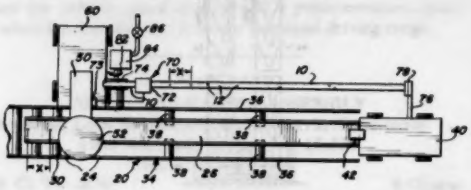
**3,643,535**

**CONTROL METHOD AND APPARATUS FOR A FABRICATING SYSTEM**

**Raymond L. Valente, Kankakee, Ill.**

**Filed Apr. 27, 1970, Ser. No. 32,097**
**Int. Cl. B26d *5/32***
**U.S. Cl. 83—50** **21 Claims**

Control apparatus and a method for providing fabricating apparatus of the type employed with structural members, with an automated operating cycle, where various tool means at one or more tooling stations required for the fabrication of the structural members are actuated automatically. The apparatus utilizes a programming template formed from a thin, flexible metal ribbon that is coiled about a stationary reel, having a free end thereof fixed with regard to a structural member that is moving relative to said tool means. A sensing unit, also fixed, monitors movement of the programming template and upon the detection of the occurrences, indicia on said template at a monitored point produce signals that are employed to control the various functions of the operating cycle. The relationship between the control apparatus and the remainder to the system is such that the template movement corresponds exactly to that of the structural members, so that the dimensional relationship of the patterns of operations to be performed on said members may be transferred directly to the template.

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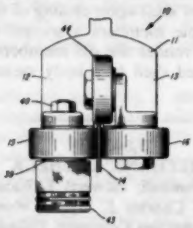
**3,643,536**

**SELF-ADJUSTING ROLLER GUIDE**

**Carl J. Alexander, Moorepark, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.**

**Filed June 1, 1970, Ser. No. 42,158**
**Int. Cl. B23d *55/08***
**U.S. Cl. 83—201.15** **2 Claims**



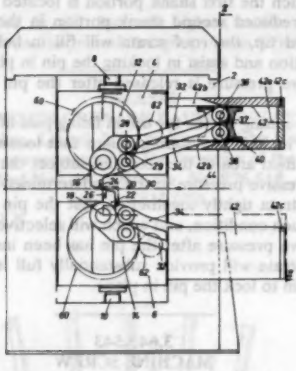
Self-adjusting band saw roller guide comprises a yoke having a pair of opposed legs with guide roller thereon. At least one of the rollers is carried by an eccentric sleeve bearing rotatably mounted on a leg of the yoke. A torque spring means mounted on the yoke engages the eccentric sleeve bearing and urges the roller to a predetermined position.

3,643,537

## CONTINUOUSLY ROTATING SHEARS

Gunter Karl Fries, Neukirchen-Saar, Germany, assignor to Moeller & Neuman GmbH

Filed Aug. 17, 1970, Ser. No. 64,293
Claims priority, application Germany, Aug. 10, 1969, P 19 42 355.3
Int. Cl. B26d *1/56*
U.S. Cl. 83—305 4 Claims



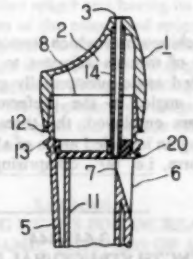
A continuously operating rotating shears for cutting rolled products to definite lengths includes cutter supports mounted on crankpins and controlled by pairs of parallel connecting rods guided at their remote ends by means of guideways. Shafts carrying the crankpins are supported in eccentric bushings which can be rotated at a different, but synchronously related, speed from the cutter shafts to provide for a variable number of miss-cuts between active cuts.

3,643,538

## MOUTHPIECE OF WIND INSTRUMENTS

Nobuo Toyama, 375 Yodobashi, Shinjuku-ku, Tokyo, Japan

Filed Mar. 19, 1970, Ser. No. 21,039
Int. Cl. G10d *7/02*
U.S. Cl. 84—384 6 Claims



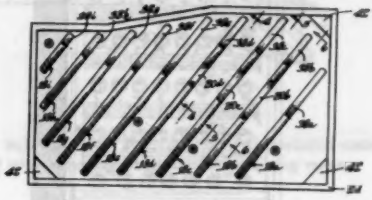

In a mouthpiece of wind instruments and the like, the improvement comprising an outer barrel portion and a thin-walled wind slot portion having a disc mounted at its base, said portions being combined together and connected to a hollow cylinder portion such that the wind slot portion is surrounded by the outer barrel portion.

3,643,539

## TONE-BALANCING RIB MEMBER

Clifford W. Andersen, DeKalb, Ill., assignor to The Wurlitzer Company, Chicago, Ill.

Filed June 1, 1970, Ser. No. 41,977
Int. Cl. G10c *3/06*
U.S. Cl. 84—195 7 Claims



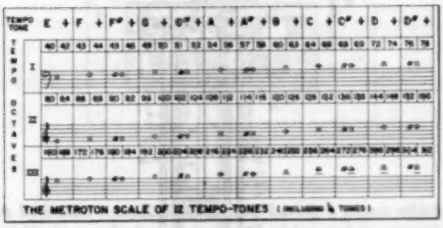
A laminated piano soundboard includes a treble and bass bridge for transmitting vibrations from the piano strings and a plurality of spaced-apart ribs for localizing the vibrations at the center, prime resonating area of the soundboard. Since the laminated character of the soundboard tends to inhibit localization thereby adversely affecting its tonal quality, carefully sized and shaped weakened areas are provided in certain preselected ones of said plurality of rib members for assuring enhanced resonance.

3,643,540

## APPARATUS, INCLUDING ELECTRONIC EQUIPMENT FOR PROVIDING A TONAL STRUCTURE FOR THE METRONOMIC DIVISIONS OF MUSICAL TIME

Milton M. Rosenstock, 780 Riverside Dr., New York, N.Y., and George J. Doundoulakis, 2498 Kayron Lane, North Bellmore, Long Island, N.Y., assignors to Milton M. Rosenstock and Albert C. Nolte, Jr., part interest to each

Filed July 21, 1970, Ser. No. 57,385
Int. Cl. G10b *15/00*
U.S. Cl. 84—484 10 Claims



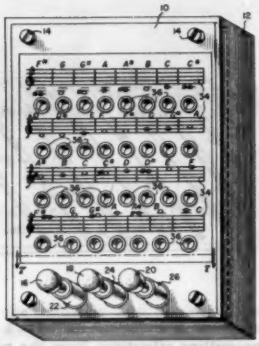

The repetition rates of audible sounds are correlated to the audio frequency values of tones. While the invention can be carried out by mechanical apparatus, the specific improvement disclosed utilizes electronic equipment for efficiency, effectiveness, accuracy and reliability. Electronic equipment produces audible tones and audible sounds. Manually operated controls select a tone or a sound, select an octave range for the tone or the sound and control the duration and repetition rate of the tone or the sound. A electroacoustic transducer connected to the controls produces the selected tone or sound in the controlled octave range at the controlled duration and repetition rate to relate pitch tonally and numerically to the repetition rate of pulse beats.

3,643,541

## MUSIC TEACHING AID

Alver W. Ruth, 1125 Young Street, Honolulu, Hawaii

Filed May 26, 1969, Ser. No. 827,769
Int. Cl. G09b 15/02
U.S. Cl. 84—485 4 Claims



An educational device for teaching a student chromatic notes and fingerings of horn instruments including a panel having note and scale representations, finger piston valves, and indicator and electrical circuit including jacks corresponding to the notes on the scale whereby placing the indicator in a jack and fingering of the piston valves causes the indicator to give a signal that the proper fingering corresponding to the selected note has occurred.

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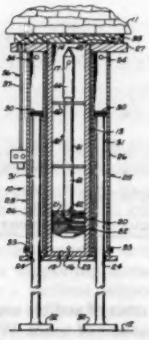
3,643,542

## MINE ROOF PINS AND APPARATUS FOR SETTING THE SAME

Gerald W. Elders, Christopher, Ill., assignor to Pin-Set Corporation, Christopher, Ill.

Continuation-in-part of application Ser. No. 846,795, Aug. 1, 1969. This application Jan. 2, 1970, Ser. No. 110
Int. Cl. F16b 15/00
U.S. Cl. 85—10 8 Claims



A roof pin adapted to be pressed into a mine roof which includes an elongate shank having a head at one end and a pointed tip at the other end, a first portion of the shank being of greater peripheral dimension than a second portion to control the amount of surface pressure and skin friction when pressed into the mine roof, and thereby predetermine the force required for insertion. The relative longitudinally axial length of the first and second shank portions are preselected to provide such regulation. In one embodiment, the first shank portion is located ahead of the relatively reduced second shank portion in the direction of the pointed tip to provide a passage in the roof strata that is larger than the reduced second shank portion.

The method of installing a pin of this type in a mine roof comprises the steps of inserting the elongate pin by pressing into the mine roof, subjecting the mine roof to a compressive pressure in the area of the pin to force the strata tightly together so that the pin will hold the strata in such condition, and releasing the compressive pressure after the pin has been inserted so that the roof strata will provide substantially full length contact with the pin to lock the pin in place. In those pins in which the first shank portion is located ahead of the relatively reduced second shank portion in the direction of the pointed tip, the roof strata will fill in behind the first shank portion and assist in locking the pin in place when the compressive pressure is released after the pin has been inserted.

The pin-setting device for use in fixing pins of this type in a mine roof include positioning means that locate the pin at a predetermined area of the roof and subject the mine roof to the compressive pressure in the predetermined area to force the roof strata tightly together so that the pin will hold the strata in such condition, and which will selectively release the compressive pressure after the pin has been inserted so that the roof strata will provide substantially full length contact with the pin to lock the pin in place.

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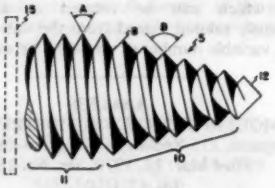
3,643,543

## MACHINE SCREW

Charles E. Gutshall, Ellwood City, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Sept. 4, 1970, Ser. No. 69,771
Int. Cl. F16b 25/00, 35/00
U.S. Cl. 85—46 4 Claims



A coarse machine screw which terminates in a gimlet point has a plurality of threads adjacent to the point end which have an included angle substantially greater than the standard included angle. In the preferred embodiment, two thread forms are employed, the thread form adjacent the point end having an included angle of about 90° and the standard thread form, i.e. 60°, comprising the balance of the threads.

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3,643,544

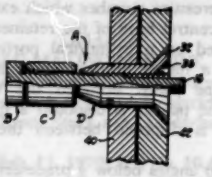
## HIGH-STRENGTH STRUCTURAL BLIND FASTENER FOR USE IN AIRPLANES, ROCKETS AND THE LIKE

Joseph H. Massa, Rocky River, Ohio, assignor to The National Screw & Manufacturing Company, Cleveland, Ohio

Filed Feb. 27, 1969, Ser. No. 803,040
Int. Cl. F16b 13/06, 39/30
U.S. Cl. 85—72 3 Claims

A three-part high-strength structural-type blind fastener of the bolt- and nut-type, the parts of which are made of high-

strength material and have a structural design relationship



which provides in the fastener higher tensile and shear characteristics and improved clamp up characteristics.

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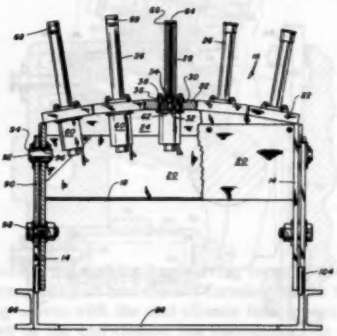
**3,643,545**

**ZERO BREECH GRENADE-LAUNCHING SYSTEM**

**Joseph A. Nahas, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Nov. 13, 1969, Ser. No. 876,518**
**Int. Cl. F41f *1/06***
**U.S. Cl. 89—1 F** **4 Claims**



A grenade-launching pod including a housing supporting a matrix of spigots aimed to cover a sector of approximately 20°. Each spigot includes a hollow pipe containing a slidable firing pin biased rearwardly by a coil spring. A matrix of solenoids is secured to the inside of the housing, each one aligned with a respective spigot and having its plunger in contact with the firing pin of the associated spigot. A propellant cartridge is removably held in a slot in the end of each spigot and a grenade tail pipe is fitted over the spigot. When energized, the solenoid propels its plunger which pushes the firing pin into a primer in the propellant cartridge which in turn fires the cartridge and propels the grenade off the spigot and along a ballistic trajectory.

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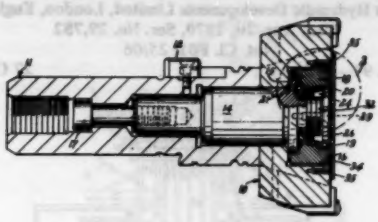
**3,643,546**

**TUNED DAMPING MEANS FOR INCREASING THE MINIMUM DYNAMIC STIFFNESS OF A SPINDLE SYSTEM**

**Robert C. Richter, Cincinnati, Ohio, and Shimoga K. Srinath, Seattle, Wash., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Dec. 18, 1969, Ser. No. 886,063**
**Int. Cl. B23c *9/00*; B23b *47/00***
**U.S. Cl. 90—11 A** **12 Claims**

The minimum dynamic stiffness of a milling cutter and its holder, which form a spindle system, is increased by disposing a tuned damped vibration absorber, which comprises a damping mass supported by a viscoelastic material element,



within the milling cutter. The element of viscoelastic material is retained within the damping mass by retaining means.

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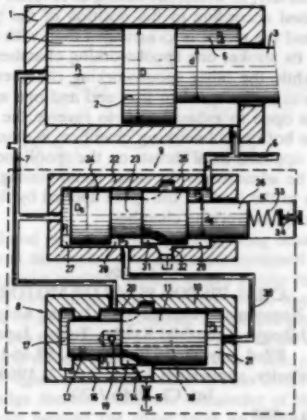
**3,643,547**

**HYDRAULIC RECIPROCATING ENGINE**

**Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sept. 16, 1969, Ser. No. 858,445**
**Claims priority, application Netherlands, Sept. 18, 1968, 6813313**
**Int. Cl. F15b *13/042*, *11/08***
**U.S. Cl. 91—48** **2 Claims**



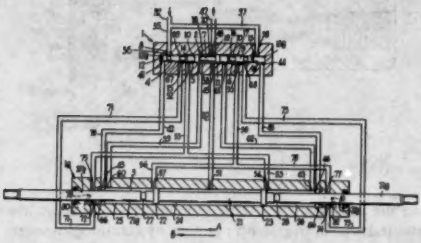
A hydraulic reciprocating engine having a piston which is movable in a cylinder, at least one piston rod is secured to the piston. On one side of the piston a supply pressure prevails, and on the other side a regulating pressure prevails. A pressure regulating system is connected between the duct in which the supply pressure and the regulating pressure prevails. The value of a regulating pressure is adjustable in accordance with the value of the supply pressure and in accordance with an adjusting element, for example a spring, acting on a regulating valve of the system. The pressure-regulating system has at least one regulating member, in which the ratio of the surfaces of the regulating member has such a value that in the absence of a force exerted by the adjusting element, the regulating pressure adjusted by the pressure regulating valve relative to the supply pressure, has a value which is inversely proportional to the ratio of the value of the piston surfaces of the hydraulic motor.

**3,643,548**

## FLUID-PRESSURE-OPERATED MOTORS

**Philip Butterworth, Bramhall, England, assignor to Butterworth Hydraulic Developments Limited, London, England**

**Filed Apr. 20, 1970, Ser. No. 29,782**
**Int. Cl. F01l** *25/06*
**U.S. Cl. 91—298** **27 Claims**



A fluid-pressure-operated reciprocating motor having a spool and piston slidable in spool and piston cylinders respectively in which the spool has a first pair of opposed faces which respectively communicate with a pair of spool-working chambers, and a second pair of opposed faces which respectively communicate with a pair of spool-biasing chambers, and the piston is double acting and has a pair of opposed faces which respectively communicate with a pair of piston chambers, reversal of the piston being initiated by reversal of the spool which serves to connect one piston chamber alternately to fluid pressure and to exhaust and to connect the other piston chamber alternately to exhaust and to fluid pressure respectively; in which the timing of reversal of the spool is determined according to the position of the piston in its cylinder, and the motor is so arranged that, with the spool at an end of its stroke, one spool-working chamber is open to pressure while the other spool-working chamber is open to exhaust to urge the spool to that end and one spool-biasing chamber is open to exhaust and, to reverse the spool, fluid pressure in both spool-working chambers is caused to apply equal and opposite axial thrusts on the spool and pressure is caused to be admitted to the other spool-biasing chamber in opposition to the load on the spool applied by fluid pressure in said one spool-working chamber.

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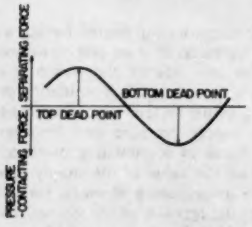
**3,643,549**

## AXIAL PISTON PUMP OR MOTOR

**Kuniyasu Nagatomo, Fukuoka-ken, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed July 27, 1970, Ser. No. 58,464**
**Claims priority, application Japan, Aug. 1, 1969, 44/60821**
**Int. Cl. F04b** *1/20*
**U.S. Cl. 91—505** **4 Claims**




An axial piston pump or motor comprises a cylinder barrel fixedly mounted on a rotating shaft, a plurality of cylindrical bores formed axially in the cylinder barrel, piston slidably fitted in the associated bores, a swashplate adjustably arranged at a desired inclination angle with respect to the axis of the shaft, slipper pads each engaged with an end of each piston and a retainer ring for keeping the slipper pads in contact with the swashplate.

A spherical pressure member which externally engages a corresponding central bore of the retainer ring is internally slidably mounted on a cylindrical portion of an annular pusher having a flange portion which is in turn slidably mounted on the shaft. Between the spherical pressure member and the pusher is disposed a first spring while a second spring is disposed between the pusher and the cylinder barrel.

As inclination angles below a predetermined valve of the swashplate, the retainer ring is urged toward the swashplate through engagement of the flange of the annular pusher with the spherical pressure member under the force of the second spring. At an inclination angles above the predetermined valve, the retainer ring is urged through engagement of the flange of the pusher therewith at a point.

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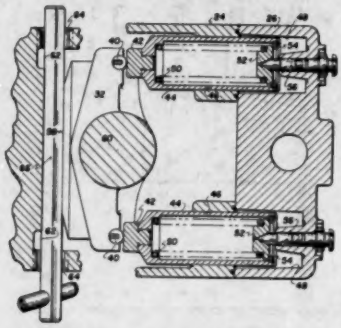
**3,643,550**

## POWER TRANSMISSION

**Robert J. Lease, Rochester, Mich., assignor to Sperry Rand Corporation, Troy, Mich.**

**Filed Feb. 16, 1970, Ser. No. 11,528**
**Int. Cl. F04b** *1/20*
**U.S. Cl. 91—506** **3 Claims**



A variable displacement piston pump or motor unit has an oscillatable yoke controlled by double-acting preloaded spring centering mechanism. Abutments are provided in the casing and on the yoke between which a tool may be wedged to hold the yoke in neutral position while the centering springs are being adjusted. The housing has openings providing access for the tool, which openings may also serve as fluid connections.

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**3,643,551**

## HYDRAULIC CYLINDER

**David A. Berg, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**

**Filed Aug. 7, 1970, Ser. No. 62,028**
**Int. Cl. F01b** *29/00*
**U.S. Cl. 92—128** **9 Claims**

A hydraulic cylinder having a cylindrical sleeve with a closure wall on the end including a seal and a resilient lock ele-

ment removably positioned to fix the axial position of the wall relative to the sleeve.

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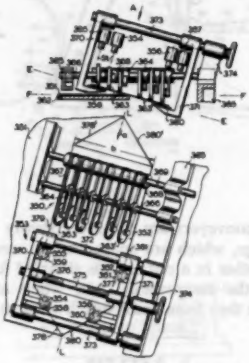
3,643,552

## BAG-MAKING MACHINE

Willi Stork, Apfelallee 3, 4542 Techlenburg, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany, by Elfriede Stork geb. Aufderhaar, heir of said Stork, deceased

Filed Feb. 11, 1970, Ser. No. 10,486
Claims priority, application Germany, Feb. 11, 1969, P 19 06 774.4
Int. Cl. B31b *1/08*; B65b *57/02*; B31b *29/74*
U.S. Cl. 93—27 11 Claims



A machine for making bags having cross bottom end closures, comprising an end closure forming station from which each bag moves with the end closure folded over so that an inner half of the end closure lies flat against one side of the bag, a delivery station and, disposed between the stations, a diverter which is controlled by end-closure checking means and is effective to reject faulty moving bags from a conveying path for the bags between the stations, the checking means for said inner half comprising photoelectric reflection sensors cooperating with stationary reflectors for checking any deviation in the position of edges of the inner half from a predetermined desired position as the bags are moved past the checking means, wherein guide means provided in the conveying path for the bags are effective to engage each end closure and erect it to an oblique position so that the said inner half of the end closure is lifted off the said bag side, the reflectors being carried by a bracket disposed such that the reflectors pass between the bag side and the lifted inner half as the bag moves past the checking means.

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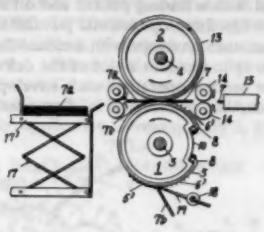
3,643,553

## STRIP MACHINE

Hideo Morimoto, 1090 Kono-machi, Adachi-ku, Tokyo, Japan

Filed Oct. 16, 1969, Ser. No. 866,962
Int. Cl. B26d *7/18*; B31b *1/14*
U.S. Cl. 93—36 A 5 Claims

A strip machine comprising a waste strip roll and a press roll arranged opposite to each other. A waste contour corresponding to a waste portion to be cut from the material cardboard is placed on a soft plate such as rubber and a number of pins are pierced from the back side of said waste contour through said soft plate so that the tips of pins project from the surface of the soft plate. Such plate is removably placed on the circumferential surface of said strip roll. When another developed configuration of a cardboard box is applied to the strip roll, the old waste contour is replaced with a new one with a number of pins planted so that the positions of the pins are altered on the strip roll.



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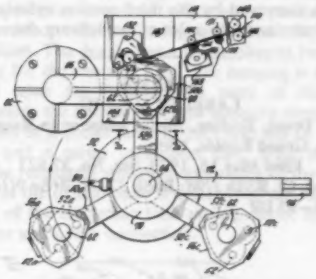
3,643,554

## BOX MANUFACTURING APPARATUS

Gerald Lippman, Oceanside, N.Y., assignor to Thermo-Dielectric Machine Co., Inc.

Filed Mar. 20, 1970, Ser. No. 21,306
Int. Cl. B31b *1/12*, *1/72*, *9/60*
U.S. Cl. 93—36.3 10 Claims



A method and apparatus for manufacturing boxes. A sheet feeder feeds in succession sheets of predetermined peripheral configuration to a working station where a strip feeder feeds an elongated strip along the periphery of the sheet. After a given length of strip corresponding to the peripheral length of the sheet has been fed to a position next to the edge of the sheet, the strip is cut, and then a fastening unit presses part of the strip against an outer face of the sheet along the peripheral edge thereof while the remainder of the strip extends inwardly beyond the sheet form an endless side of a box. The apparatus and method are particularly suitable for manufacture of heart-shaped boxes.

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3,643,555

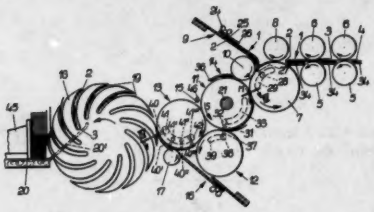
## FLAP FOLDING APPARATUS FOR ENVELOPE MAKING MACHINES

Guenter Ehlscheid, Neiderbieder, Germany, assignor to Winkler & Duennebier, Neuwied am Rhine, Germany

Filed Sept. 23, 1970, Ser. No. 74,661
Claims priority, application Germany, Oct. 13, 1969, P 19 51 548.1
Int. Cl. B31b *21/00*
U.S. Cl. 93—62 3 Claims

Machine for producing envelopes has a flap folding apparatus whereby the flap of an envelope is optionally folded against its rear side, or after being previously folded is opened once again, or is folded against the front side of the envelope. The apparatus has a first suction cylinder and delivery discs. The invention is particularly characterized in

that between the first suction cylinder and the delivery discs there are provided a second and third suction cylinder preceded by an adjustable stop abutment and a flap opener and associated with a folding pocket and a folding cylinder. The apparatus has three operational possibilities. According to the first one, each envelope with a closed flap is conveyed by the suction cylinders into a slot of the delivery discs. According to the second operation each envelope is conveyed by the first suction cylinder to a stop abutment, then is



gripped by the third suction cylinder and is conveyed in the opposite direction to a flap opener, so that the envelope with an open flap is conveyed into the slot of the delivery discs. According to the third operation each envelope which is provided with a precreased folding edge and a flap is transferred by the first and second suction cylinders into a folding pocket and then is conveyed by the third suction cylinder under a folding cylinder and into a slot of the delivery discs.

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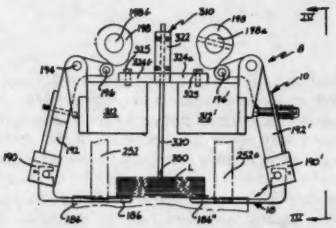
**3,643,556**
**LABEL STACKING**

**Donald H. Drent, Belding, Mich., assignor to Rospatch Corporation, Grand Rapids, Mich.**

**Filed May 15, 1970, Ser. No. 37,621**
**Int. Cl. B31b *1/98*; B65b *27/08*; B65c *9/10***
**U.S. Cl. 93—93 DP** **5 Claims**



Apparatus for stacking labels or the like, employing cooperative apparatus that advances the individual labels successively to stacking comb means, where the previously advanced and stacked labels are momentarily elevated on a specially controlled basis, for insertion of the individual label beneath the stack portion and above the comb means, with unique reciprocated control means on the forming stack.

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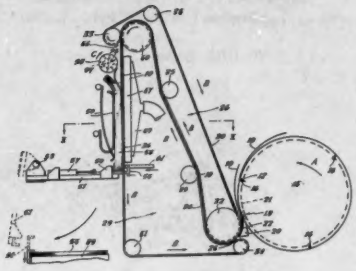
**3,643,557**
**BAGMAKING MACHINES**

**Bruce Ian Hayes, Bristol, England, assignor to Beasley French & Company Limited, Bristol, England**

**Filed Aug. 14, 1970, Ser. No. 63,801**
**Claims priority, application Great Britain, Aug. 14, 1969, 40,773/69**
**Int. Cl. B65h *33/00***
**U.S. Cl. 93—93 DP** **5 Claims**

At the delivery end of a bagmaking machine, upper and lower endless belt conveyors are arranged to run face to face over a common portion of their respective paths. The beginning of this portion provides a nip which receives the bottom end of each bag in turn as it is ejected from the surface of a rotating drum. The bags are conveyed between the conveyors through their common portion and are delivered therefrom downwardly to a delivery station at which they are



arrested. The conveyors are run more slowly than the drum so that the bags, which are spaced apart around the drum, overlap each other in a continuous shingled form when they pass through the conveyors. Thus, when arrested at the delivery station they from easily into a stack or wad of bags.

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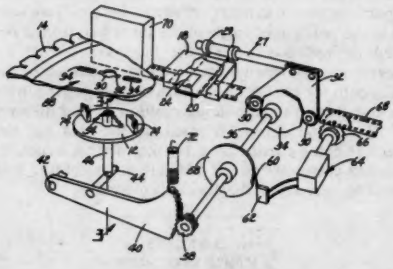
**3,643,558**
**AUTOMATIC SETTING FOR PHOTOCOMPOSING MACHINE**

**Roland F. Hecker, Berkeley Heights, N.J., and Mahmut I. Goench, Queens Village, N.Y., assignors to Vari-Typer Corporation, Hanover, N.J.**

**Filed Aug. 13, 1970, Ser. No. 63,539**
**Int. Cl. B41b *21/08***
**U.S. Cl. 95—4.5** **14 Claims**



A photocomposing machine of the type where an annular set of character transparencies mounted on a disc form carrier is utilized in conjunction with a sensitized strip and a light to expose the strip with the desired characters. The machine is provided with an arrangement wherein the disc has reference surfaces to set the aperture size for the lighthouse as well as a full font or half font mode of filmstrip advancement.

3,643,559

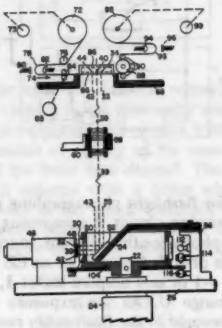
## PHOTOGRAPHIC TYPE-COMPOSING MACHINE

Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla.

Continuation-in-part of application Ser. No. 629,300, Apr. 7, 1967, now abandoned , Continuation-in-part of application Ser. No. 368,839, , now Patent No. 3,291,015, Continuation-in-part of application Ser. No. 441,738, , now Patent No. 3,422,736, Continuation-in-part of application Ser. No. 506,936, , now Patent No. 3,416,420, Continuation-in-part of application Ser. No. 617,912, Feb. 23, 1967, now Patent No. 3,512,562. This application May 21, 1969, Ser. No. 827,128

Int. Cl. B41b *19/00, 19/06, 21/24*

U.S. Cl. 95—4.5 32 Claims



A high-speed photographic type-composing machine is disclosed. Light is projected from a source of illumination such as a cathode-ray tube, laser, or multiplicity of flashlamps through a plurality of light-directing means such as light channels to an arcuate projection zone which is formed by a portion of the curved surface of a rotatable character-carrier. The light channels may be movable in unison among a plurality of discrete positions relative to the arcuate projection zone. The characters are carried on filmstrips which are mounted on a rotatable drum by rigid holding means in the form of arcuate segments, and the characters continually pass through the projection zone, which is large enough to include a plurality of characters at any given time. Selected characters are projected from the zone to an image-receiving surface (such as a film) by an optical projection system which may include a field-flattening lens. Control circuitry is provided for storing and sorting selected characters such that these characters may be illuminated in a sequence which is dissimilar to their respective positions in the composed line. The control circuitry is adapted to achieve this result by varying the time at which any selected character is illuminated as it passes through the projection zone, and is further adapted to center lines on the film by delaying the projection of the first character of the line by a time interval which is dependent upon the selected point size. Also, the film may be incrementally moved by stepping motors in order to compensate for relative displacement between the film and characters if the character-type style and/or point size is changed.

3,643,560

## EXPOSURE TIME SETTING DEVICE FOR A PHOTOGRAPHIC CAMERA WITH A FROSTED GLASS PLATE PRECISION SETTING AND AN ELECTRONIC TIME SETTING ARRANGEMENT

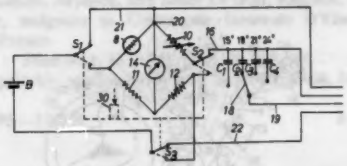
Heinrich Sylvester Bonk, Calmbach, Germany, assignor to Prontor-Werk Alfred Gauthier, GmbH, Calmbach Black Forest, Germany

Filed June 24, 1969, Ser. No. 836,081

Claims priority, application Germany, July 2, 1968, P 17 72 777.4

Int. Cl. G01j *1/44*; G03b *7/08*

U.S. Cl. 95—10 C 7 Claims



A device for the light dependent setting of the exposure time of a photographic camera having a frosted glass pane observation plane for controlling the exposure adjustment and an electronic time setting arrangement comprising resistance-capacitance members which are separately selectable in accordance with the photographic sensitivity of the exposed medium. The device has a funnel-shaped housing with an opening for the entry of light. The housing is adapted to be placed upon the frosted glass pane of the camera. Disposed inside the housing is a light sensitive element that is a component of a bridge circuit which also has an adjustable resistance and a meter movement coil. With these components, the resistance value corresponding to the degree of brightness of the frosted pane is determined and delivered to the circuit of the electronic time setting device by a switch arrangement and a wire connection.

3,643,561

## EXPOSURE CONTROL SYSTEM FOR A SINGLE LENS REFLEX CAMERA

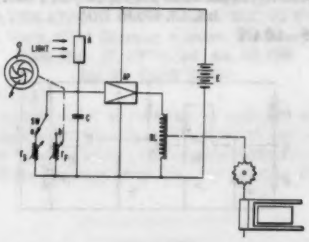
Saburo Numata, Ohmiya, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Ohmiya-shi, Saitama, Japan

Filed Feb. 3, 1970, Ser. No. 8,219

Claims priority, application Japan, Feb. 3, 1969, 44/7943

Int. Cl. G03b *7/08*

U.S. Cl. 95—10 CT 2 Claims




A single-lens reflex camera which includes a photosensitive light sensor having diode characteristics and a hinged mirror that is swung out of the view finder optical system during shutter release. The shutter is electrically operated through a relay coil under the control of an electrical condenser connected to the relay coil for controlling shutter speed. The photoelectric sensor is series connected to a source of voltage. A switch coupled to the shutter selectively connects a

pair of resistors in parallel with the condenser and in series with the sensor during shutter release.

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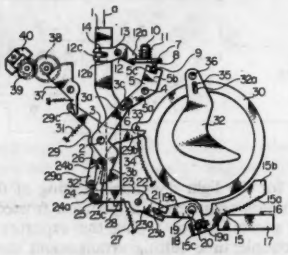
3,643,562

## PROGRAMMING SHUTTER FOR A PHOTOGRAPHIC CAMERA

Matsuzaki Soichiro; Masanobu Sato, and Kato Toshikazu, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1970, Ser. No. 90,289
Claims priority, application Japan, Nov. 22, 1969, 44/111050; Nov. 27, 1969, 44/112675
Int. Cl. G01j 1/04
U.S. Cl. 95—10 CE 4 Claims



A photographic shutter in which the shutter blades are opened to such an extent as to define the effective aperture of the objective corresponding to the scene brightness for obtaining the proper exposure. The shutter has a first lever which pivots through a predetermined angle each time the shutter is operated, a second lever coupled with a shutter blade operating ring so as to open the shutter blades to an objective aperture corresponding to the pivoting movement of the second lever, and a third lever interposed between the first and second levers so as to transmit the movement of the first lever to the second lever. The pivot axis of the third lever is shifted in accordance with the scene brightness sensed by a photoelectric exposure control device so that the second lever is moved at a variable transmission ratio by the first lever in accordance with the sensed scene brightness for proper exposure.

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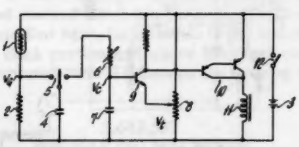
3,643,563

## SHUTTER-TIMING NETWORK

Tsukumo Nobusawa, Asaka-shi, Saitama-ken, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 23, 1969, Ser. No. 835,524
Claims priority, application Japan, July 3, 1968, 43/45878
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CT 5 Claims



A shutter-timing network comprises a photoconductor and first resistor connected in a series, a timing circuit including a variable second resistor and timing capacitor connected in series, a memory capacitor, and a switch alternatively connecting the memory capacitor across the first resistor and across the timing circuit. The timing capacitor is connected to the input of a solid-state switch whose output controls a shutter closure release electromagnet. The first resistor may be variable and the switch response voltage may be adjusted by a variable resistor bias control. The various adjustments are made in accordance with photographing parameters other than the incident light.

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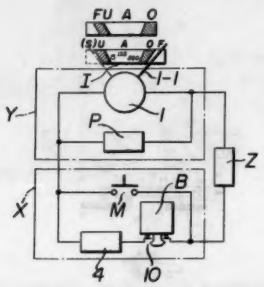
3,643,564

## INDICATOR FOR FLASHLIGHT PHOTOGRAPHY

Takashi Uchiyama, Tokyo, Japan, assignor to Canon Inc., Tokyo, Japan

Filed Oct. 21, 1969, Ser. No. 868,085
Claims priority, application Japan, Oct. 28, 1968, 43/78462; Dec. 6, 1968, 43/106459
Int. Cl. G01j 1/44; G03b 7/02, 7/16
U.S. Cl. 95—10 C 25 Claims




An indicator for flashlight photographing is provided with an exposure-measuring circuit Y comprising at least an ammeter 1 and a photosensitive current source P. "A flash-ready" range F is provided outside of an EE operation range A of a pointer 1—1 of said ampere meter 1, an overrange 0 and an under range U. As the exposure is adjusted the pointer 1—1 is brought in the flash-ready range F to indicate that the preparation for flash photography is completed.

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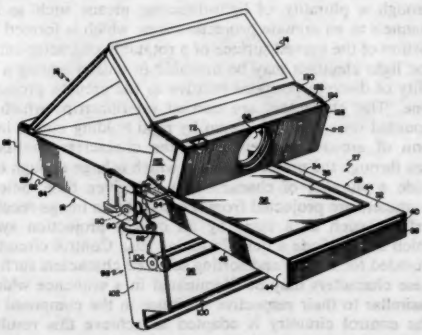
3,643,565

## FOLDING CAMERA WITH DEVELOPING MEANS

Alfred H. Bellows, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1970, Ser. No. 102,775
Int. Cl. G03b 19/02, 17/52
U.S. Cl. 95—11 R 7 Claims



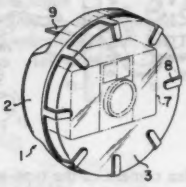
A compact folding camera of the self-developing type including an open ended chamber for receiving a film assemblage. A lens housing section and a processing housing section are mounted in closing relation to the open end of the chamber when the camera is folded. Both are movable, in opposite directions, to expose the open end of the chamber to allow a film assemblage to be inserted into or withdrawn from the chamber through the open end.

3,643,566

## UNDERWATER CASE FOR CAMERAS

Sadanao Ando, Musashino-shi, Tokyo, and Nobuki Matsumoto, Yokohama-shi, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Sept. 19, 1969, Ser. No. 859,498
Claims priority, application Japan, Sept. 27, 1968, 43/84592
Int. Cl. G03b *17/08*
U.S. Cl. 95—11 W 3 Claims



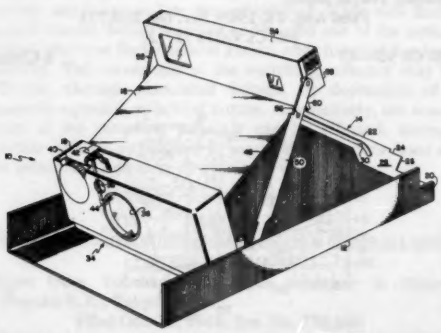

An underwater case for cameras whose specific gravity when housing a camera is less than unity and which has support members for supporting the camera within the case so as to deviate the center of gravity of the camera from that of the case toward the front face thereof. The case has a rear surface which is colored with a color which can readily distinguish the case in the water. Ordinary cameras can be used for underwater photography and the case housing the camera floats and can be readily recognized under water.

3,643,567

## CAMERA LATCH

Lawrence M. Douglas, Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1969, Ser. No. 885,420
Int. Cl. G03b *17/04*
U.S. Cl. 95—11 R 11 Claims



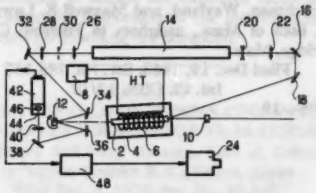
A folding camera including a plurality of housing sections pivotally coupled for movement between a compact, folded position and an extended, operative position. A shutter-actuating member is provided for actuating the camera's shutter and a detent located adjacent the shutter actuating member is adapted for movement into locking engagement with the shutter-actuating member to prevent actuation of the camera's shutter in all positions of the camera except the fully extended, operative position. In an alternative embodiment the camera's shutter actuating member is provided with a solenoid-controlled detent. The solenoid circuit includes three switches connected in series; the first being closed by movement of the shutter-actuating member; the second being closed only when the camera is in the fully extended position; and the third being closed only when the camera's loading door is closed thereby insuring operation of the shutter only when the camera is in the fully extended position and the loading door is closed.

3,643,568

## LASER SYNCHRONIZING ARRANGEMENT FOR PHOTOGRAPHIC ILLUMINATION

Hubert Guillet, Arpajon, and Denis Le Goff, Enghien, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Sept. 15, 1969, Ser. No. 858,056
Claims priority, application France, Sept. 13, 1968, 166255
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 R 8 Claims




A laser synchronization system synchronizes the emission of a light pulse on a laser triggered by a rotating mirror and the control of the exposure of a photographic camera by means of a light pulse. The system comprises a light detector connected to the camera and is adapted to supply an electrical pulse suitable for controlling the camera. An auxiliary light source in the form of an auxiliary laser directs a light beam through an optical system onto the light detector when the rotating mirror is in appropriate angular position. Two semitransparent mirrors define the optical resonating cavity of the auxiliary laser, and the auxiliary laser emits light in two opposite directions in the form of a visual display beam and a synchronizing beam whereby a visual display of the path of light emitted by the triggered laser is achieved by a continuous light beam supplied by the auxiliary light source.

3,643,569

## COLOR RESTORATION OF UNILAYER AND DUOLAYER COLOR PHOTOGRAPHIC ELEMENTS

William E. Vary, 4734 Bromley Avenue, Bradbury Park, Md.

Filed May 25, 1970, Ser. No. 40,400
Int. Cl. G03b *33/00*
U.S. Cl. 95—12.2 13 Claims

Full or partial color is restored to unilayer or duolayer emulsion films which have been sensitized to only one primary color per layer by adding the required subtractive primary color(s) to the viewing, projection, or printing illumination means.

3,643,570

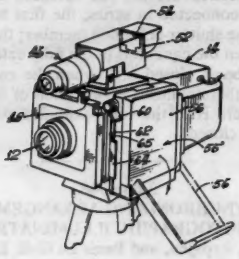
## DUAL CAMERA

Marvin A. Reid, and William R. Swift, both of Placentia, Calif., assignors to Coleman Engineering Company, Inc., Santa Ana, Calif.

Filed Mar. 17, 1969, Ser. No. 807,718
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 10 Claims

To provide an immediate duplicate of an image projected

by a beam of light onto a conventional film in a camera, a



beam splitter is employed to reflect a portion of the beam to project the same image on "Polaroid" film in the camera.

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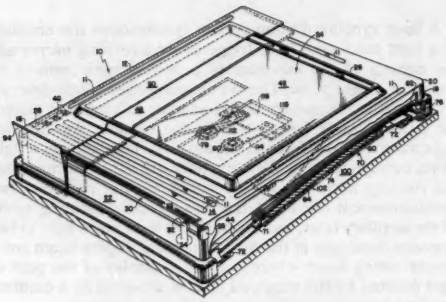
**3,643,571**

## PHOTOGRAPHIC FILM ASSEMBLAGE

**Irving Erlichman, Wayland, and Maxwell E. Lawrence, West Acton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 19, 1968, Ser. No. 785,157**
**Int. Cl. G03b *19/10***
**U.S. Cl. 95—19** **26 Claims**



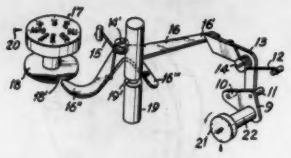
A photographic film pack including a container having a forward wall and dependent end and sidewalls formed of a rigid vapor-impermeable material such as sheet metal and an opening at the rear; a plurality of self-developing film units each including a photosensitive element stacked within the container; a support member located behind the stack of film units; a battery located behind the backing member; and a vapor-impermeable closure for the opening at the rear, the closure being displaceable relative to the forward wall. The forward wall includes an exposure opening and one end wall is formed with a withdrawal opening for the film units. A vapor-impermeable cover is removably secured to the container in closing relationship to the exposure and withdrawal openings. The film pack is adapted to be employed in electrically operated photographic apparatus, having a spring-biased pressure member adapted to extend into the container through the opening at the rear for urging the film units toward the forward wall to locate the forwardmost film unit in position for exposure, and spring-biased electrical contacts for engaging the terminals of the battery to couple the battery to electrically energized means within the camera.

**3,643,572**

## CAMERA STRUCTURE FOR PREVENTING IMPROPER AUTOMATIC EXPOSURES

**Hiroshi Kurei, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Filed Oct. 30, 1970, Ser. No. 85,641**
**Claims priority, application Japan, Dec. 6, 1969, 44/115580**
**Int. Cl. G01j *1/00, 1/52***
**U.S. Cl. 95—42** **10 Claims**



A single-lens reflex camera of the type which provides automatic exposure determination with light received through the objective. A mirror or reflector has a viewing position in the path of light received through the objective and permitting proper automatic exposure determination. This reflector also has an exposure position situated beyond the latter path of light and preventing proper automatic exposure determination. For special photography purposes, a manually operable positioning structure coacts with the reflector to maintain it in its exposure position. A manually operable selecting structure is provided for selecting either automatic exposure determination or one of a plurality of exposure-determining factors. A shutter release is available to be manually actuated for tripping the shutter. A blocking structure coacts with the shutter release as well as with the positioning structure and selecting structure to block the shutter release automatically in response to location of the positioning structure in its position maintaining the reflector in its exposure position and to location of the selecting structure in the position providing for automatic exposure determination.

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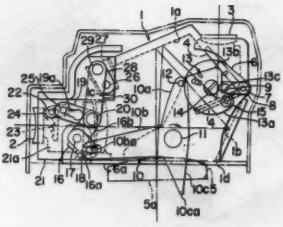
**3,643,573**

## EYE-LEVEL EYEPIECE SHIELDING DEVICE FOR EYE-LEVEL AND WAIST-LEVEL VIEWFINDER

**Kenji Hiruma, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Aug. 18, 1969, Ser. No. 850,711**
**Int. Cl. G03b *19/12***
**U.S. Cl. 95—42** **5 Claims**



An eye-level eyepiece shielding device for a camera in which a waist-level eyepiece is disposed upwardly of a final reflecting surface of a pentaroof-type reflecting mirror of a viewfinder optical system of a single-lens reflex camera, an eye-level eyepiece is disposed in the vicinity of a light exit of said pentaroof-type reflecting mirror, a planar reflecting mirror is disposed between the waist-level eyepiece and the final reflecting surface, and a shielding plate which can optionally shield and open the eye-level eyepiece is disposed forwardly of the eye-level eyepiece, the shielding plate being adapted to

optically shield or open the eye-level eyepiece in response to the rotation of the planar reflecting mirror through a cam mechanism and a link mechanism so that when the waist-level eyepiece is used the external light through the eye-level eyepiece may be prevented from entering into the viewfinder optical system.

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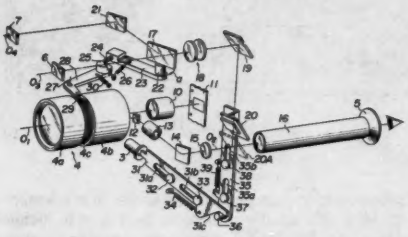
**3,643,574**

## FOCUSING DEVICE FOR OPTICAL EQUIPMENT

**Hisao Moriyama, Chino, and Katsuhide Takagi, Okaya, both of Japan, assignors to Sankyo Kogaku Kogyo Kabushiki Kaisha, Suwa-shi, Japan**

**Filed July 29, 1970, Ser. No. 58,828**
**Claims priority, application Japan, July 31, 1969, 44/73096**
**Int. Cl. G03b** *3/00*
**U.S. Cl. 95—44 C** **9 Claims**



A focusing device is provided for optical equipment of the type having a pair of windows providing respective focusing light beams, a taking lens system including a focusing lens having a bodytube, and a view finder optical system. The focusing device comprises a semitransparent focusing mirror positioned in the optical path of one focusing light beam and a focusing total reflector positioned in the optical path of the other light beam and reflecting the other light beam to the semitransparent mirror. Either the semitransparent mirror or the total reflector is connected to the bodytube of the focusing lens for angular displacement responsive to focusing movement of the focusing lens. An image-forming optical system of high magnification is positioned in the optical path behind the semitransparent mirror. An optical path switching reflector is disposed rearwardly of the image-forming lens system, and is moved into the optical path of the view finder optical system during focusing and moved out of the optical path of the view finder optical system after focusing has been effected. This movement of the switching reflector may be effected, through associated linkage, by depression of a manually operable switching button. Alternatively, the movement of the switching reflector can be effected, through suitable linkage, responsive to movement of a lens hood on the taking lens bodytube or cylinder.

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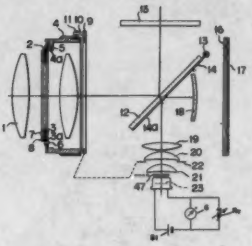
**3,643,575**

## EXPOSURE-MEASURING DEVICE IN A SINGLE-LENS REFLEX CAMERA

**Shigeo Ono, Yokohama-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Oct. 25, 1968, Ser. No. 770,666**
**Claims priority, application Japan, Oct. 31, 1967, 42/69584**
**Int. Cl. G03b** *19/12, 9/02*
**U.S. Cl. 95—42** **4 Claims**

An exposure meter system for a single-lens reflex camera which can function either by sensing the light passing through the maximum diaphragm opening of an interchangeable lens mounted on the camera or by sensing the light which has been restricted by the diaphragm of the interchangeable lens. Light from the interchangeable lens is directed through a relay optical system to a photocell. An adjustable aperture in the relay optical system is adapted to be connected to the diaphragm ring of the interchangeable lens to adjust the sensitivity of the photocell for different aperture ratios of different interchangeable lenses. When the adjustable aperture in the relay optical system is not connected,



compensating means associated with the photocell are automatically actuated to enable the exposure meter system to operate by using the diaphragm of the interchangeable lens to control the light reaching the photocell.

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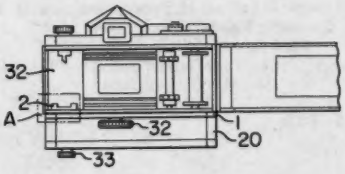
**3,643,576**

## CAMERA CAPABLE OF COMBINATION WITH A POWER-DRIVEN HOUSING FOR FILM-REWINDING

**Kouichi Daitoku, and Shuji Kimura, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Dec. 4, 1970, Ser. No. 95,147**
Claims priority, application Japan, Dec. 12, 1969, 44/117539; 44/117540
**U.S. Cl. 95—31 EL** **7 Claims**



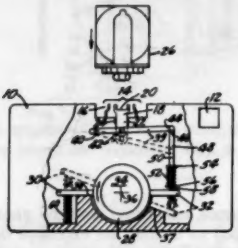
A camera of the type which uses a magazine provided with a supply spool having the opposite ends thereof exposed out of the shell of the magazine, a slit for passing a film therethrough and capable of being opened and closed, and a slit-operating means for opening and closing the slit provided in one end face of the magazine. The camera includes an aperture formed below a film magazine containing chamber, and a light-intercepting cover for covering the aperture to prevent the entry of any extraneous light therethrough while enabling the opening and closing of the camera's backplate and the slit of the film magazine, whereby power-driven film-rewinding operation can be accomplished by replacing the light-intercepting cover with power-driven film-rewinding means, and the camera's backplate and the slit of the film magazine can be opened and closed with the power-driven film-rewinding means mounted on the camera. The camera may further include a retaining member for retaining the light-intercepting cover so as to inhibit the removal of such cover unless the camera's backplate is opened, and a release member for releasing the light-intercepting cover from its retained position provided in the film magazine containing chamber.

3,643,577

## CAMERA HAVING FOCUS ADJUSTMENT ASSEMBLY

Paolo Monachesi, Carcare, Italy, assignor to Societa' Per Azioni Ferrania

Filed Apr. 1, 1969, Ser. No. 811,885
Claims priority, application Italy, Apr. 4, 1968, 15,957
Int. Cl. G03b 3/00
U.S. Cl. 95—45 7 Claims



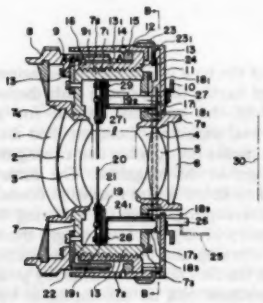
A camera is shown having a focus adjustment assembly, a focusing lens having a principal axis, and a support for attachment of an illumination device to the camera. The focus adjustment assembly causes the focusing lens to traverse its principal axis between near and distant focusing positions in response respectively to attachment to or removal from the camera of the illumination device.

3,643,578

## PHOTOGRAPHIC CAMERA LENS AND DIAPHRAGM-MOUNTING MECHANISM

Tatsuo Kobayashi, Kaizuka; Keisuke Maeda, Osaka, and Kyozo Uesugi, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 9, 1970, Ser. No. 9,717
Claims priority, application Japan, Feb. 18, 1969, 44/12094; Mar. 19, 1969, 44/21049
Int. Cl. G03b 9/07
U.S. Cl. 95—64 B 3 Claims



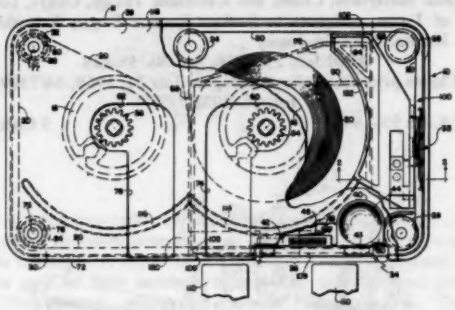
A lens and diaphragm mounting barrel mechanism for a photographic camera. The mechanism comprises a fixed barrel and a rotatable barrel interconnected by helicoid structures to cause relative axial movement of the rotatable barrel in response to rotation thereof. A diaphragm is mounted within the rotatable barrel and is interconnected with the fixed barrel to prevent its rotation relative to the latter.

3,643,579

## MOTION PICTURE PROCESSING SYSTEM

Rogers B. Downey, Lexington, and Paul W. Thomas, Duxbury, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1969, Ser. No. 888,604
Int. Cl. G03d 3/00
U.S. Cl. 95—89 R 39 Claims



An applicator system particularly useful in a compact motion picture film-handling cassette and which includes a dispensing container having a reservoir chamber for retaining processing fluid with an orifice provided therethrough. A slider displaceably mounted for movement along the dispensing container includes a frame portion across which a strip of flexible material is mounted to overlay the container's orifice. An opening is provided through the strip of flexible material to be out of alignment with the orifice when the slider is in its initial position, to be aligned with the orifice when the slider is in a second position and to once again be out of alignment with the orifice when the slider is in a third position. A leaf spring carried by the slider continually urges a pressure plate towards the strip of flexible material. The filmstrip is progressively advanced across the orifice intermediate the strip of flexible material and the aforementioned pressure plate. When the slider is in its initial and third positions, guide tracks on the dispensing container position the pressure plate in spaced-apart relationship to the filmstrip. These guide tracks are configured such that, when the slider is in its second position, the pressure plate slideably engages the filmstrip against the flexible material. Cooperating portions of the slider and the dispensing container engage one another to preclude further movement of the slider once it has been displaced into its third position.

3,643,580

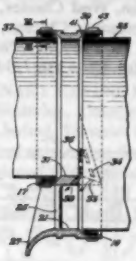
## FLUID DISTRIBUTION APPARATUS PRESERVING ALIGNMENT OF LONGITUDINAL AXES OF FLOW

Matthew Siegel, 4051 Riverside Court, Fort Worth, Tex.

Filed Dec. 1, 1969, Ser. No. 881,016
Int. Cl. F24f 7/00
U.S. Cl. 98—40 C 16 Claims

Apparatus for use in a fluid distribution system characterized by a combination hanger and coupling adapter having a coupling means with ends adapted to receive and support ends of ducts with their respective longitudinal axes being maintained in linear alignment so as to preserve the velocity component of a fluid flowing therethrough; and fastening means such as spring clips retained in each end of the coupling means and adapted to move outwardly to allow passage of the end of the ducts and to snap inwardly once the ends have passed, retaining the ducts in the coupling means. Great flexibility is attainable since one end of the coupling means may be smaller than the other and may be concentrically or eccentrically positioned to provide a vent means for

general or directional distribution of a fluid flowing therethrough. The apparatus enables economical and rapid



installation of a fluid distribution system, as well as low-operating cost.

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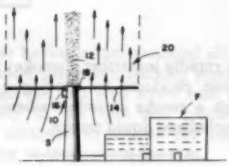
**3,643,581**
**FAN ARRANGEMENT FOR POLLUTION CONTROL**
**Lewis Feldman, 15 Ireland Place, Amityville, N.Y.**
**Filed Jan. 6, 1969, Ser. No. 789,118**
**Int. Cl. A23c 9/10**
**U.S. Cl. 98—58** **14 Claims**



A rotary fan arrangement mounted on a structure such as a smokestack creates a plume of ambient air concentric with the pollutants rising upwardly from the stack, the plume of air serving both to dilute the pollutants and to carry the pollutants aloft. In one embodiment, the fan arrangement includes hinged blades and, in another, centrifugally erected sail rotors.

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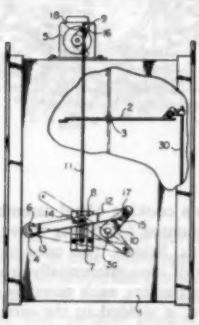
**3,643,582**
**SAFETY MECHANISM FOR A FLOW CONDUIT DAMPER**
**Hisashi Mochida, Osaka, Japan, assignor to Daito Mfg. Co., Ltd., Osaka, Japan**
**Filed June 4, 1970, Ser. No. 43,423**
**Claims priority, application Japan, June 6, 1969, 44/53068**
**Int. Cl. F23l 17/02**
**U.S. Cl. 98—86** **7 Claims**



An additional safety mechanism of a fuse melt type applied to a damper arrangement for controlling a temperature condition of an objective circumstance such as air in a room by adjusting a flow rate of a heat medium through a conduit duct upon detection of the temperature for effecting instant intercepting of the flow path upon detection of an abnormal overheated medium's passing in a manner independent from the flow rate controlling action.

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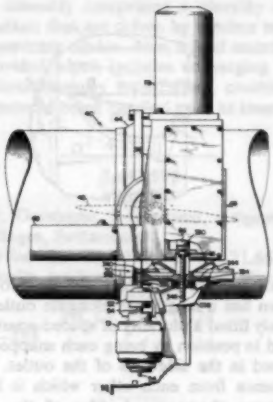
**3,643,583**
**BLAST VALVE ACTUATOR**
**Norman George Fritz, Del Mar, Calif., assignor to International Harvester Company, San Diego, Calif.**
**Filed Jan. 21, 1969, Ser. No. 792,263**
**Int. Cl. F23l 17/00**
**U.S. Cl. 98—119** **21 Claims**



Blast valve assemblies having a rotary or butterfly-type valve member and an actuator including a valve-closing mechanism which is cocked in an inoperative configuration when the valve is open. Pressure on the valve member or a signal to a solenoid incorporated in the actuator unlatches the valve-closing mechanism which slams the valve to its closed position. Reset mechanism is incorporated in the actuator to recock the closure mechanism and reopen the valve.

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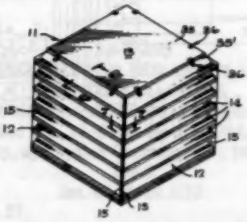
**3,643,584**
**READILY ASSEMBLED VENTILATOR HOUSING**
**Albert S. Sheppard, Granada Hills, Calif., assignor to The Exitaire Company, Pacoima, Calif.**
**Filed June 8, 1970, Ser. No. 44,278**
**Int. Cl. F24f 13/08**
**U.S. Cl. 98—121** **13 Claims**



A housing formed of louvered panels having similar angularly disposed end plates for abutting relation at the corners to act as posts and to receive securing means for fastening

the panels together and a top plate secured by clips to the panels.

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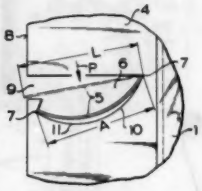
3,643,585

## DISTRIBUTOR DUCT WITH FLEXIBLE BAFFLE PLATES

Ulrich Barteleit, Kornwestheim; Walter Regenscheit, Zuffenhausen; Helmut Schroder, Ludwigsburg, and Erich Wolf, Wangen, all of Germany, assignors to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Sept. 19, 1969, Ser. No. 859,375
Claims priority, application Germany, Oct. 4, 1968, P 18 01 201.6
Int. Cl. F24f *13/06*
U.S. Cl. 98—121 8 Claims



A distributor duct for a pressure airflow through a baking or drying oven has a lengthwise elongate outlet into which are transversely fitted a plurality of spaced-apart flexible baffle plates held in position by being each snapped in a pair of notches formed in the sidewalls of the outlet. The notches are at a distance from each other which is less than the distance between the engaged sides of the baffle plates thereby forcing the plates into a curved configuration and tensioning the plates against the notch walls.

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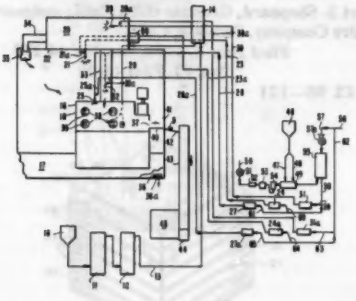
3,643,586

## ASEPTIC PACKAGING OF FOODS

David V. Robinson, Laurel, Md., assignor to Donald A. Rosini, Shamokin, Pa., a part interest

Filed July 8, 1970, Ser. No. 53,087
Int. Cl. B65b *55/06*
U.S. Cl. 99—234 R 9 Claims



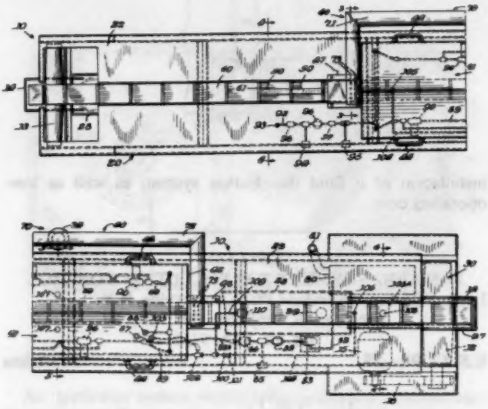
A method is provided for producing an aseptically packaged food product in which the food is sterilized and then packaged under aseptic conditions in presterilized containers. An apparatus for carrying out the method is provided.

3,643,587

## SMOKING MACHINE

Herbert A. Harrington; William M. Allen, both of Cincinnati, and William C. Kuhn, West Chester, all of Ohio, assignors to Beatrice Foods Company, Chicago, Ill.

Filed Nov. 10, 1969, Ser. No. 875,083
Int. Cl. A23b *1/04*
U.S. Cl. 99—261 9 Claims



Apparatus for rapidly imparting a smokey flavor to a quantity of comestible products by moving a stream of said products through a smoke chamber wherein said products are exposed to nebulized liquid smoke.

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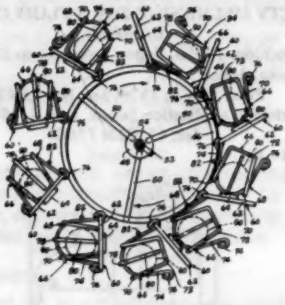
3,643,588

## COOKING WHEEL ASSEMBLY FOR BROILING HOT DOGS

John F. Schwarz, and Richard H. Bennett, both of St. Louis, Mo., assignors to Hercules Galion Products, Inc., Galion, Ohio

Filed Oct. 17, 1969, Ser. No. 867,200
Int. Cl. A47g *27/14*
U.S. Cl. 99—427 9 Claims



There is shown a cooking wheel assembly for broiling hot dogs rotatably mounted for power movement in a cabinet beneath an electric heater. The cooking wheel, which includes a plurality of circumferentially spaced elongated hot dog receiving wire baskets, each pivotally mounted on a wire platform or cover, is welded to the circumferences of two spaced wheels. The automatic relationship of each basket to its cover in 360° of rotation of the spaced wheels is such that in one segment of travel the basket is spaced from its cover,

permitting removal of a cooked hot dog and insertion of one for broiling. In the remaining travel segment, the basket and cover trap and roll the hot dog to present all surfaces to the heater.

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**3,643,589**

**STATIONARY REFUSE PACKER**

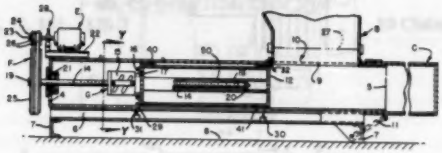
**Franklin T. Carter, Waterloo, Ontario, Canada, assignor to Belgium Standard Limited, Toronto, Ontario, Canada**

**Continuation-in-part of application Ser. No. 758,889, Sept. 10, 1968, now abandoned. This application July 27, 1970, Ser. No. 58,598**

**Claims priority, application Canada, Feb. 23, 1968, 13,248**

**Int. Cl. B30b *15/14***

**U.S. Cl. 100—49** **7 Claims**



A refuse packer having a ram mounted slidably in a housing for reciprocation between a packing position and a loading position, a ball nut and feed screw ram actuator is connected operatively to the ram and electrically operated power means is arranged to actuate the ball nut and feed screw ram actuator to reciprocate the ram.

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**3,643,590**

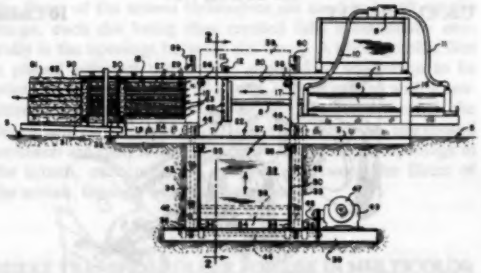
**VERTICAL-HORIZONTAL BALING PRESS**

**Dominick M. Aluotto, Brooklyn, N.Y., assignor to Antonio Aluotto, Brooklyn, N.Y.**

**Filed Sept. 29, 1970, Ser. No. 76,468**

**Int. Cl. B65b *13/02*; B30b *7/04***

**U.S. Cl. 100—53** **5 Claims**



The baling press has a horizontal portion and a vertical portion and is adapted to bale waste paper and other loose and bulky materials. The horizontal portion embodies a conventional baling chamber and a plunger operated by a hydraulic cylinder. The vertical portion embraces a pit disposed between the baling chamber and the plunger when in retracted position, with a lifter of special construction within the pit and cooperating with the end walls of the pit.

**3,643,591**

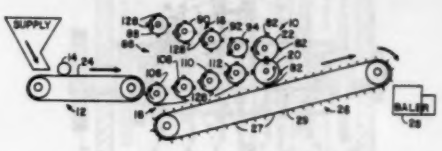
**CUTTING DEVICE**

**Charles Gail Bragg, 1238 York Avenue, Corpus Christi, Tex.**

**Filed Mar. 30, 1970, Ser. No. 23,832**

**Int. Cl. B30b *3/04***

**U.S. Cl. 100—95** **11 Claims**




A cutting assembly comprising a plurality of interposed roller-type cutters that are driven by a prime mover through a torque transmitting device. Also, a feed material conveying device is provided which includes converging live-roll conveyors for simultaneously transporting, crushing and compacting the material being handled prior to insertion into said cutters.

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**3,643,592**

**PRESS**

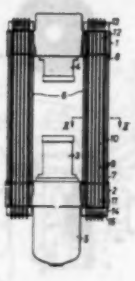
**Harry Blaser, Oensingen, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland**

**Filed Mar. 23, 1970, Ser. No. 21,663**

**Claims priority, application Switzerland, Mar. 24, 1969, 4395/69**

**Int. Cl. B30b *15/28***

**U.S. Cl. 100—214** **5 Claims**



A press comprising a press frame formed of a lower yoke and an upper yoke and intermediate members for interconnecting said lower yoke with said upper yoke. Further, a plurality of preloaded tensioning cables, apart from the aforementioned intermediate members, serve to hold together both of said yokes.

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**3,643,593**

**FOIL-FEEDING UNIT FOR BED AND PLATEN HOT DIE PRINTING MACHINE**

**Hans Krosel, Gladbacherstr. 56, 4018 Langanfeld, Germany**

**Filed Dec. 11, 1968, Ser. No. 782,804**

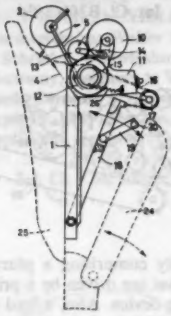
**Claims priority, application Germany, Jan. 10, 1968, P 16 11 234.8**

**Int. Cl. B41k *3/58***

**U.S. Cl. 101—27** **7 Claims**

This invention relates to a printing unit for gold printing or the like for use in a platen press of the kind which prints the required symbols onto a substrate from a foil in the form of a web which is unwound outside a type bed of the press and rewound also outside the type bed. The unit comprises a

delivery roller for the foil, a winding roller on which the foil is rewound, a plurality of tension rollers which content the



foil, and a plurality of deflectors for the foil. These are arranged on a replaceable chase.

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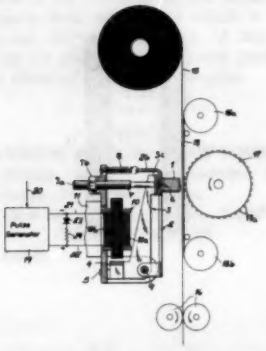
**3,643,594**
**PRINT HAMMER FOR HIGH-SPEED PRINTER**
**Roberto Pipitone, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy**
**Filed June 9, 1969, Ser. No. 831,460**
**Claims priority, application Italy, June 11, 1968, 17,577**
**Int. Cl. B41g** *9/38*
**U.S. Cl. 101—93 C** **11 Claims**



An electromagnetically actuated print hammer comprises two rockers independently pivoted on a common axle, one rocker carrying a striker and being urged by spring force against the other rocker which has a long lever arm acting upon the striker-carrying rocker and a short lever arm carrying an armature attractable by an electromagnet; upon energization of the electromagnet, the armature-carrying rocker is arrested before the striker contacts the working surface.

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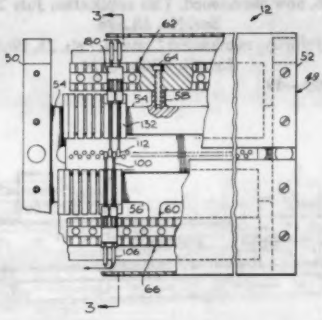
**3,643,595**
**PRINTER HAMMER BANK ASSEMBLY**
**Clifford J. Helms, Woodland Hills, and Stelios B. Papadopoulos, Westlake Village, both of Calif., assignors to Data Products Corporation, Woodland Hills, Calif.**
**Filed June 25, 1969, Ser. No. 844,789**
**Int. Cl. B41j** *9/10*
**U.S. Cl. 101—93 C** **13 Claims**

A hammer bank assembly useful in high-speed impact printers of the type generally employed in data processing systems. The assembly is comprised of a one-piece cast frame having openings therein to permit air cooling. A plurality of hammer modules are provided, each module including a pair of hammers resiliently mounted on a common foot member. A mounting bar having a plurality of aligned recesses is secured to the frame. Each recess is shaped so as to receive and precisely position a foot member along the length of the mounting bar. Additionally, each recess is provided with a cylindrical bore for receiving an internally threaded stud pro-



jecting from a foot member for precisely positioning the foot member in a direction perpendicular to the length of the mounting bar. Each hammer is comprised of an impact tip carried on a rigid coil structure disposed in a permanent magnet field. Energization of the coil develops a force on the coil structure to propel the hammer toward a print drum. An adjustable backstop, carrying a long wearing deformable and resilient sleeve, is provided for each hammer to establish a precise rest position.

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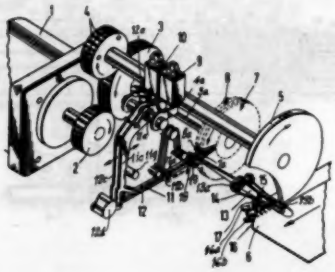
**3,643,596**
**HIGH-SPEED IN-LINE PRINTER**
**Gunther Vorbach, Schwindegg, and Harald Koch, Baierbrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**
**Filed Nov. 26, 1969, Ser. No. 880,281**
**Claims priority, application Germany, Dec. 10, 1968, P 18 13 769.4**
**Int. Cl. B41j** *7/06*
**U.S. Cl. 101—93 C** **10 Claims**



Apparatus for making flying impressions of type symbols by the use of two or more side-by-side impact wheels extending in planes parallel of the plane of a disklike-type carrier and spaced laterally therefrom. A rocking lever pivoted intermediate its ends forms the printing hammer and is actuated by coupling members independently engaged between the teeth of the rotating impact wheels. The impact wheels have teeth spaced one-half pitch apart, where two wheels are used. The teeth correspond to the characters on the type carrier,

and each impact wheel has one-half the number of teeth as the number of characters on the type carrier. The impact wheels are coupled to the type carrier to rotate therewith. The coupling members are actuated by electromagnets energized by an energy storer for the printing energy, and are selectively engaged between the teeth of the thrust wheels by the electromagnets, to actuate the rocking lever to effect the high-speed making of flying impressions of selected-type symbols. In a modified form the rocking lever moves between two stops and engages a vertically guided hammer, and moves the hammer radially to strike a recording medium against the type carrier and returns the hammer on its return stroke.

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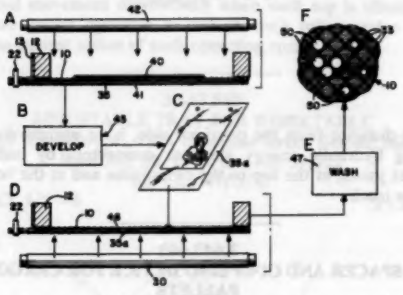
**3,643,597**

## METHOD OF MAKING SCREEN PRINTING ARTICLES

**Louis A. Lala, 1612 East Third, Dayton, Ohio**

**Filed May 12, 1969, Ser. No. 823,630**
**Int. Cl. B41n *1/24*; G03c *5/00***
**U.S. Cl. 101—128.3** **10 Claims**




A screen printing article and method of making the article includes using the fibers of the screen to divide the image to be printed into a plurality of dots, the size of each representing the density of the light passing through the screen. Since the fibers of the screen themselves are used to break up the image, each dot being thus created falls substantially centrally in the openings between the fibers. A photographic film is placed adjacent the screen, exposed to the image to be printed and developed. The screen is then coated with a sensitized emulsion, and exposed to light projected through the developed photographic film. The film and the unexposed emulsion are then removed to leave a plurality of openings in the screen, each centrally positioned between the fibers of the screen, through which ink may pass.

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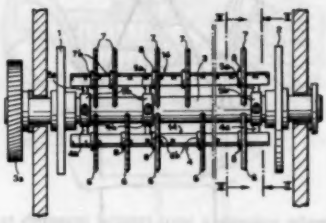
**3,643,598**

## SHEET TRANSFER ROLLER FOR USE IN MULTICOLOR ROTARY PRINTING PRESSES

**Paolo Papa, and Federico Capetti, both of Turin, Italy, assignors to Societa' Nebiolo S.p.A., Turin, Italy**

**Filed Dec. 1, 1969, Ser. No. 881,046**
**Claims priority, application Italy, Nov. 6, 1969, 50258**
**Int. Cl. B41l *41/06***
**U.S. Cl. 101—420** **4 Claims**

A sheet transfer roller for use in multicolor printing presses is formed by a number of sets of arcuate elements arranged concentrically with the roller axis and slidably mounted on respective guides carried by the roller and extending parallel to the roller axis. The arcuate element can be clamped to the guides at the desired positions by clamping screws. It can be arranged that sheet supporting members carried by the arcuate elements engage a sheet to be transferred at selected relatively print-free regions.



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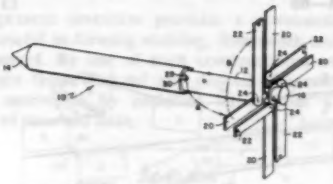
**3,643,599**

## RETRACTABLE STABILIZER FINS AND DRAG BRAKES FOR MISSILES

**Henry O. Hubich, Upperco, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed July 22, 1968, Ser. No. 746,583**
**Int. Cl. F42b *25/02***
**U.S. Cl. 102—4** **5 Claims**



Retractable stabilizing fins and drag brake apparatus having coactive connection between the stabilizing fins and drag brakes. The stabilizing fins when deployed to a position perpendicular to the missile axis present an edge to air stream. The drag brakes when deployed to a position perpendicular to the missile axis produce aerodynamic drag as well as rotate the stabilizing fins to a position to produce aerodynamic drag.

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**3,643,600**

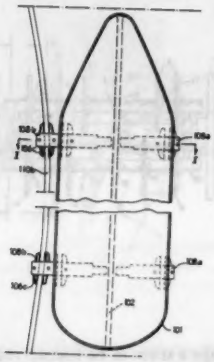
## GROUND-EFFECT TRANSPORTATION SYSTEM

**Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France**

**Continuation-in-part of application Ser. No. 782,968, Dec. 11, 1968. This application Apr. 16, 1970, Ser. No. 29,141**
**Int. Cl. B61b *13/08***
**U.S. Cl. 104—23 FS** **6 Claims**

A ground effect transit system in which an air cushion vehicle moves over a track having a guiding upright which is laterally offset with respect to a bearing track surface. The vehicle is provided on each side with a retractable guiding device in the form of an inverted U straddling the upright when the device is in its operative position, so that the vehi-

cle may then be guided selectively from its port side, or from its starboard side, or from both its port and starboard sides.



Such a device is useful for marshalling the tracked air cushion vehicle.

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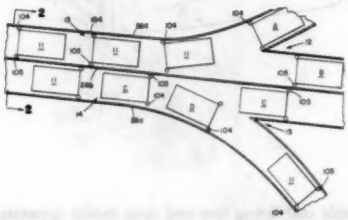
3,643,601

## TRANSPORTATION SYSTEM

Paul A. Taylor, East Hartford, Conn., and Thomas A. Boissevain, Bedford, Mass., assignors to Alden Self-Transit Systems Corporation, Bedford, Mass.

Filed June 1, 1970, Ser. No. 41,954
Int. Cl. B61b 5/02, 13/00
U.S. Cl. 104—88 11 Claims



A vehicle includes a steering mechanism and a switching mechanism that includes biasing means for biasing the steering mechanism in a selected direction away from a predetermined vehicle path, and guide sensor means for resisting the biasing means in response to path defining means external of the vehicle for maintaining the vehicle on a predetermined path.

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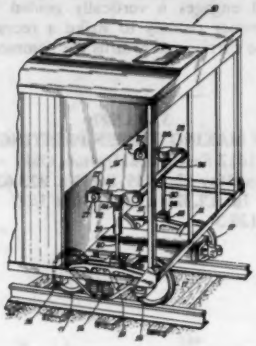
3,643,602

## RAILWAY CAR HYDRAULICALLY DAMPENED ROLL STABILIZER

Raymond M. Astrowski, 192 Lafayette Lane, Hoffman Estates, Ill.

Filed Mar. 16, 1970, Ser. No. 19,804
Int. Cl. B61d 7/00; B61f 3/02, 5/24
U.S. Cl. 105—199 A 9 Claims

A railroad car body has a crossframe above and extending approximately the width of the car truck. The proximal side of the crossframe is pivotally attached to the car body for movement about a horizontal axis. At one end of the crossframe, at a spaced distance from the proximal side, is an upright strut extending between the crossframe and the truck. The upper and lower ends of the strut are connected respectively to the crossframe and the truck by ball and socket joints. At the other end of the crossframe, and at the same distance from the proximal side, is an upright double-acting hydraulic energy absorber connected, by ball and socket joints, at the top to the crossframe and at the bottom to the truck.



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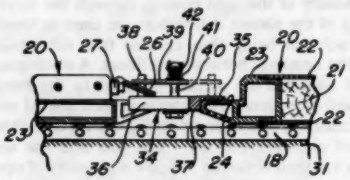
3,643,603

## SPACER AND COUPLING DEVICE FOR CARGO PALLETS

Eddie L. King, 228 South 16th Street, Richmond, Calif.

Filed Dec. 29, 1969, Ser. No. 888,464
Int. Cl. B61g 5/00; B65j 1/24
U.S. Cl. 105—366 6 Claims



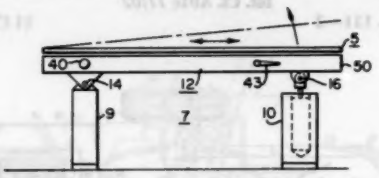

A coupling device for releasably interconnecting two successively adjacent cargo pallets to form a train thereof as when loading, unloading or while aboard a cargo aircraft or other transport therefor. Such pallets are relatively large and carry loads of several tons, and they are bordered with a perimetric frame having spaced-apart flanges therealong alternating with tiedown rings pivotally secured to the frame. The coupling device has a plate adapted to overlie the pallet flanges, and it also has a T-shaped spacer cooperative with the flanges and spaces therebetween to position two successive pallets in a predetermined spaced orientation. Posts carried by the coupling device receive tie rings from the successive pallets, and releasable lock means confines the rings in position upon the posts.

3,643,604

## TILTABLE AND TRANSLATABLE TOP MEDICAL TABLE ASSEMBLY

William E. M. Jones, Pittsburgh, and James A. Richard, Monroeville, both of Pa., assignors to CGR Medical Corporation, Cheverly, Md.

Filed Oct. 1, 1970, Ser. No. 77,094
Int. Cl. A17f 5/12
U.S. Cl. 108—5 5 Claims



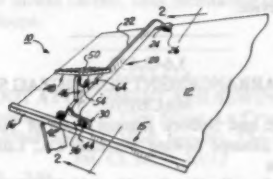

Disclosed is a medical table assembly including a normally horizontal patient support table top translatable and tiltable longitudinally relative to a transversely extending horizontal axis, one way acting roller wedge lock means biased by an operating spring to lock such top automatically against translational movement downwardly when such top is tilted, and release means operable to unlock such roller wedge lock means against action of such operating spring.

3,643,605

## ADJUSTABLE TRAY FOR WORKTABLE

Russell W. Miller, Jr., 7121 Lindsdale Street, Detroit, Mich.

Filed July 30, 1970, Ser. No. 59,422
Int. Cl. A47f 5/12
U.S. Cl. 108—6 2 Claims



A longitudinally and pivotally adjustable tray for a worktable which is mounted on the lower end of a traversing bar extending transversely across the table; the traversing bar is at both ends provided with antifriction rolling means and rail means are provided along the lower edge of the worktable to enable the traversing bar which supports the adjustable tray to be longitudinally moved along the table; the worktable may be inclined relative to a horizontal ground surface as is frequently the case in drafting tables and similar worktable arrangements and the tray is pivoted on a bracket extending upwardly from the lower end of the longitudinally movable traversing bar so that the tray may be adjusted in a horizontal position relative to the inclined position of the worktable.

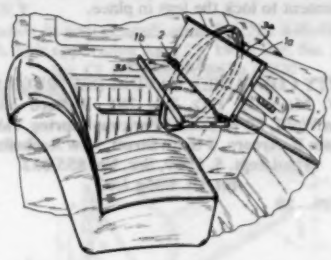
3,643,606

## TABLE STRUCTURE FOR USE IN MOTOR VEHICLES

Mathias Joseph Vise, Untere Ibern 5, Eupen, Belgium

Filed June 25, 1970, Ser. No. 49,850
Claims priority, application Germany, June 26, 1969, P 19 32 357.0
Int. Cl. A47b 23/00
U.S. Cl. 108—44 8 Claims

A table structure, especially for suspension on a steering wheel of a motor vehicle, which comprises two table sections hinged together and foldable selectively toward and away from each other into a plurality of positions in which they are arrestable while the back of the table structure is provided with a plurality of bearing means each being adapted selectively to receive suspension means for suspending the table



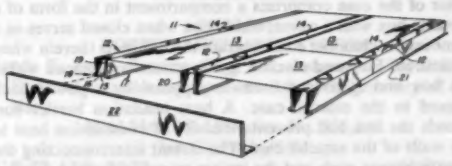
structure at different heights over a steering wheel so as to accommodate the height of suspension of said table structure to the convenience of the user of said table structure.

3,643,607

## SHELVING COMPONENTS

James Alexander MacKenzie, 70 Gloucester Street, Ottawa, Ontario, Canada

Filed Nov. 29, 1968, Ser. No. 779,760
Int. Cl. A47b 96/00
U.S. Cl. 108—111 9 Claims



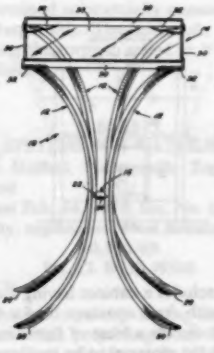
The present invention provides a constructional component useful in forming shelving, framework and combinations thereof. By use of such constructional components, lightweight framework of any desired dimensions can be readily assembled by unskilled labor from a minimum number of standard sizes.

3,643,608

## TABLE CONSTRUCTION

Frederick DeCesaris, Providence, R.I., assignor to Guild Metal Products, Inc., Providence, R.I.

Filed May 11, 1970, Ser. No. 36,005
Int. Cl. A47b 3/06
U.S. Cl. 108—157 2 Claims



A table construction having a plurality of curved legs that are joined together by a clip element intermediate to the

ends thereof. The clip element as joined to the leg requires no fasteners or screws and an upper frame is secured to the uppermost portions of the leg members and cooperates with the clip element to lock the legs in place.

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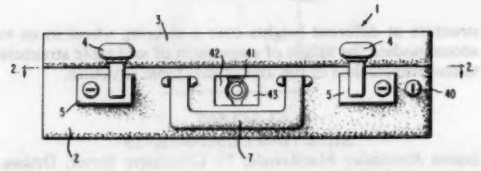
**3,643,609**

**SECURITY CONTAINER HAVING DESTRUCT MEANS**

**Dennis W. Maywald, P.O. Box 281, Bedford Hills, N.Y.; Solomon Wolff, 80 Rockland Parkway, Spring Valley, N.Y., and James R. Arcara, 9 Sixth Street, New Rochelle, N.Y.**

**Filed Sept. 5, 1969, Ser. No. 855,632**
**Int. Cl. E05g *1/02***
**U.S. Cl. 109—29** **4 Claims**



A piece of luggage in the form of an attache case is equipped with destruct means for destroying the contents therein in response to an intentionally given signal. The interior of the case comprises a compartment in the form of a metallic box with a cover, which box when closed serves as a combustion chamber to incinerate the contents therein when so desired. Fuel and electric igniter means are placed within the box and ignition current is supplied by a power pack housed in the attache case. A heat insulation barrier surrounds the box and prevents transfer of combustion heat to the walls of the attache case. The circuit interconnecting the electric power pack and the igniter means includes a number of normally open switches arranged in series; all of which must be closed to initiate and start the destruct cycle. One switch is closed in response to closure of the attache case, and others may be deliberately closed by key means or the like. The final switch is closed by a pushbutton in the vicinity of the attache case handle, whereby the carrier of the case may set off the destruct cycle by manipulating the pushbutton with a finger of the hand around the handle.

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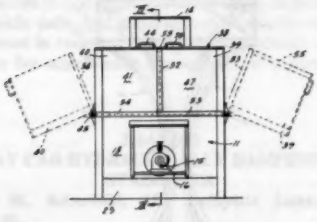
**3,643,610**

**INCINERATOR**

**William R. Bycroft, P.O. Box 126, Williamsfield, Ill.**

**Filed July 15, 1960, Ser. No. 55,009**
**Int. Cl. F23g *5/12***
**U.S. Cl. 110—8 C** **23 Claims**



An incinerator includes a cabinet having a concave hopper that is apertured with draft openings, and a burner supplied by fluid fuel which directs a blast of flame inwardly through the cabinet against the material to be incinerated that is supported on the hopper. Door means expose substantially the entire upper side of the hopper, and within the cabinet there is provided a guard at the burner opening to prevent suffocation of the flame.

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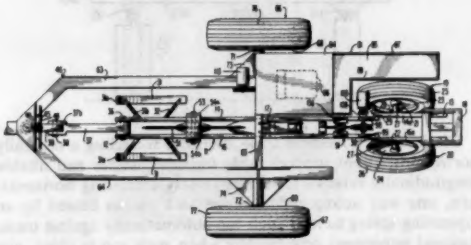
**3,643,611**

**PLANTING APPARATUS**

**Edwin G. Owens, and Joseph J. Wiley, Jr., both of Summerville, S.C., assignors to Westvaco Corporation, New York, N.Y.**

**Filed Nov. 13, 1969, Ser. No. 876,491**
**Int. Cl. A01c *11/02***
**U.S. Cl. 111—2** **11 Claims**



Apparatus for setting plants such as tree seedlings into the ground including a planter frame having a front end arranged to be attached to a tractor for freely pivotal movement in a vertical plane by means including a support frame and having a rear end supported on earth compacting means in front of which are supported on the planter frame, furrow-forming means and a plant-setting device, the planter frame being arranged to follow the contour of the ground during its forward movement independently of the support frame on which an operator is supported for manually feeding plants to the plant-setting device.

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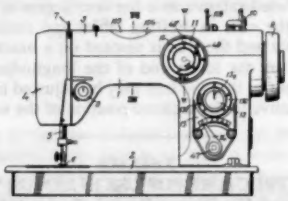
**3,643,612**

**FEEDING ARRANGEMENT FOR ZIGZAG SEWING MACHINE**

**Susumu Hanyu, and Noboru Kasuga, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Chuo-ku, Tokyo, Japan**

**Continuation of application Ser. No. 645,585, June 12, 1967. This application Nov. 21, 1969, Ser. No. 872,449**
**Claims priority, application Japan, June 13, 1966, 41/37776**
**Int. Cl. D05b *3/02***
**U.S. Cl. 112—158 R** **20 Claims**



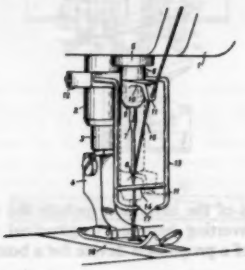
The feeding of a sewing machine can be automatically controlled by a cam, or manually controlled by a knob. Manual control means, which preferably can also be used for making buttonholes by setting the feed regulator to forward feeding, reverse feeding and minimum feeding, also connect and disconnect the cam follower from the cam of the automatic operating mechanism so that manual control and automatic operation of the feed regulator do not interfere.

3,643,613

## DEVICE FOR GUIDING THE NEEDLE THREAD OF SEWING MACHINES

Lothar Schwehm, Kaiserslautern, Germany, assignor to G.M. Pfaff AG, Kaiserslautern Pfalz, Germany

Filed Aug. 9, 1968, Ser. No. 751,422
Claims priority, application Germany, Sept. 23, 1967, P 30 120/52
Int. Cl. B65h *59/12, 63/00*
U.S. Cl. 112—218 R 2 Claims



A device for guiding the needle thread of sewing machines including a lug having a thread guide eyelet mounted on the needle bar and a frame mounted on the stepper foot shaft, which frame has a crossbar that extends transversely proximate the path of the needle and is overlapped by the thread guide eyelet when the needle is in the lower position. This device serves to seize the excess thread between the needle eye and the thread carrier, thus facilitating the formation of the thread loops.

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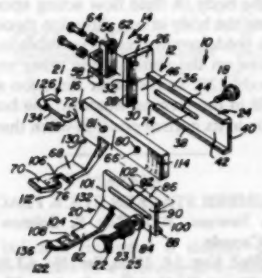
3,643,614

## ZIPPER FOOT ATTACHMENT FOR SEWING MACHINES

Leoda J. Gooderum, 1133 Vine Street, La Crosse, Wis.

Filed June 11, 1968, Ser. No. 736,166
Int. Cl. D05b *29/12*
U.S. Cl. 112—240 18 Claims



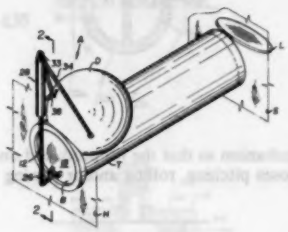
A presser bar attachment for sewing machines of different types, accommodating the sewing of zipper tapes to garments. Zipper chains of different widths may be received between adjustably spaced foot elements engageable with the garment fabric. The foot elements are adjustably positioned to receive the needle through one of the aligned slots formed in both confronting edges of the foot elements.

3,643,615

## EXTERIOR-OPERATED BREECH DOOR

Paul Cohen, Glen Cove, N.Y., assignor to Subcom Inc., Glen Cove, N.Y.

Continuation-in-part of application Ser. No. 848,419, Aug. 8, 1969. This application Apr. 22, 1970, Ser. No. 30,895
Int. Cl. B63g *8/00*; B63b *19/00*
U.S. Cl. 114—16.4 10 Claims



A communicating passage for submersible vessels in which a chamber has an entranceway and a closure door therefor with the operative structures for the door being exterior of the door and the chamber for moving the door between open and closed positions.

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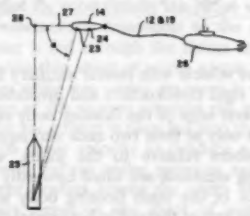
3,643,616

## TORPEDO GUIDANCE SYSTEM

Louis F. Jones, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 24, 1964, Ser. No. 355,146
Int. Cl. F42b *19/01*
U.S. Cl. 114—21 W 11 Claims



Method and means of guiding a torpedo along a collision course with a moving target ship, wherein the torpedo maintains a predetermined substantially constant lead angle with respect to the target ship. The lead angle is maintained constant by adjusting the torpedo speed as it travels toward the anticipated collision.

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3,643,617

## STABILIZER SYSTEMS FOR WATER-BORNE VESSELS

Stanley Joseph Holden, Portsmouth, England, assignor to Vosper Limited

Filed Feb. 24, 1970, Ser. No. 13,599
Claims priority, application Great Britain, Feb. 27, 1969, 10,552/69
Int. Cl. B63b *39/06*
U.S. Cl. 114—126 16 Claims

A stabilizer system for a ship having one or more hollow closed cylinders or fins projecting from the ship's hull into the water stream. Each cylinder or fin is provided with apertures through which water under pressure, supplied by a pump via valves, is directed to produce a variable boundary

layer flow of water giving positive or negative lift on the or each cylinder or fin. The valves are operated by a hydraulic actuator in accordance with signals from a gyroscopic

sensing mechanism so that the lift produced on each cylinder or fin opposes pitching, rolling and/or yawing motion of the ship.

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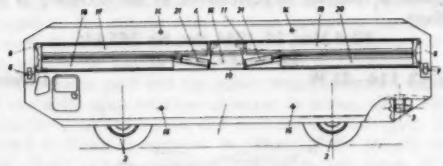
**3,643,618**
**AMPHIBIOUS VEHICLE WITH AUXILIARY FLOATING ELEMENTS**

**Hermann Walter Gehlen, Pirmasenser Strasse 60, Kaiserslautern Pfalz, Germany**

**Filed Nov. 14, 1969, Ser. No. 876,855**
**Claims priority, application Germany, May 14, 1969, P 19 24 613.0**
**Int. Cl. B60f** *3/00*
**U.S. Cl. 115—1 B** **2 Claims**



Amphibious vehicle with lateral auxiliary floating elements which are of rigid construction and pivotable about joints at the upper lateral edge of the floating body of the vehicle and are linked on only at their two ends and equipped there with spacing members relative to the joints, which when the lateral floating elements are tilted upwardly provide a space over the deck of the main floating body which they cover which is of the extent thereof in horizontal direction and of a height determined by the spacing elements.

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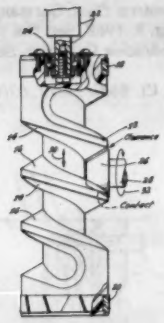
**3,643,619**
**LONGITUDINAL TO ROTATIONAL MOTION**

**James H. Nicholson, 5501 Onacrest Drive, Los Angeles, Calif.**

**Filed Aug. 3, 1970, Ser. No. 60,527**
**Int. Cl. B63h** *16/12*
**U.S. Cl. 115—24** **16 Claims**

An apparatus for providing a conversion between longitudinal and rotational motion including a screw member having a thread having a constant angle and with individual ones of the opposing lands of the thread serving as the rolling surface for a cone member. The cone member is positioned within the lands of the thread and the cone member engages only one of the lands at a time along a line contact. Relative longitudinal movement between the screw member and the cone member is accomplished simultaneously with a relative helical movement between the screw member and the cone member and with the longitudinal motion and the helical motion between the screw member and the cone member occurring in either direction depending upon which of the lands is engaged by the cone member. The cone member also has a rotation about its central axis and such rotation occurs in a single direction.



Other aspects of the invention include the use of the apparatus for converting between longitudinal and rotational motion as part of a propulsion device for a boat.

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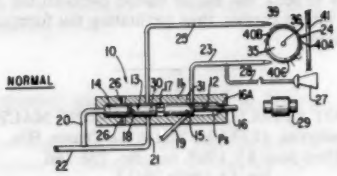
**3,643,620**
**MULTICOLOR INDICATOR FOR A FLUID OPERATED SYSTEM**

**Peter A. Penny, Stratford, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.**

**Filed Sept. 8, 1969, Ser. No. 856,115**
**Int. Cl. G08b** *1/04*
**U.S. Cl. 116—65** **1 Claim**




A visual indicator comprises a rotatably mounted body having three different positions and colors painted over a 120° portion of the body peripheral surface and vanes on each end of the body. A fluid flow acting upon the vanes on one end rotates the body in one direction through an angle of 120° so that a predetermined color is visible in a viewing window. Fluid flow on the vanes at the other end of the body rotates the body 120° in the other direction so that another color is visible in the viewing window. The body is weighted so as to remain in its normal position when there is no flow.

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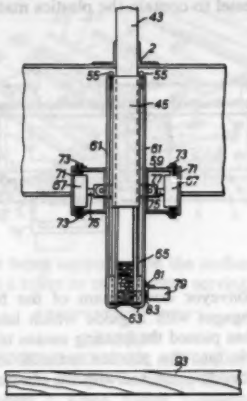
**3,643,621**
**LUMBER STACKER STICK PLACER**

**Ray William Newnes, P.O. Box 8, Salmon Arm, British Columbia, Canada**

**Filed Aug. 14, 1970, Ser. No. 63,858**
**Claims priority, application Canada, Aug. 27, 1969, 60567**
**Int. Cl. B65g** *59/06*
**U.S. Cl. 214—8.5 K** **11 Claims**

The apparatus of this invention consists of a number of stick-placing units, each unit consisting of a vertically disposed elongated magazine-type container for containing sticks, a holding mechanism for holding the sticks in the magazine, and movable means for transporting the lowermost stick from the magazine and placing it upon a layer of lumber. The units are positioned in places where sticks are required and all the units are operated simultaneously by an

operating mechanism. The operation of the apparatus id controlled by limit switches, and initiation of an operating cycle



is controlled by a limit switch on a lumber stacker associated with the stick placer.

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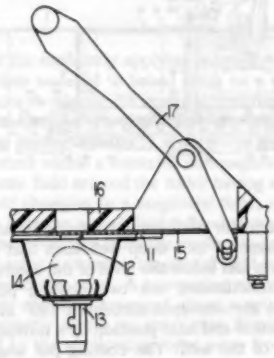
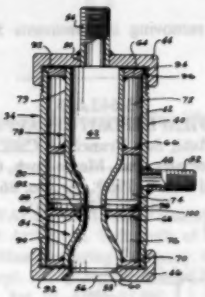
**3,643,622**
**POSITION INDICATORS**
**Edward Cryer, Higham near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**
**Filed July 10, 1970, Ser. No. 53,913**
**Claims priority, application Great Britain, Aug. 12, 1969, 40,190/69**
**Int. Cl. G09f 9/00**
**U.S. Cl. 116—124** **2 Claims**



A position indicator includes a display panel which receives one end of each of a plurality of optical cables, the one ends of the optical cables being disposed to form a composite pattern such that predetermined sets of the one ends define required legends. The other ends of the optical cables terminate in a receiving station and the indicator further includes a light source capable of illuminating the other ends of the optical cables and a mask mounted for sliding movement between the light source and the receiving station. The mask serves in different positions to permit illumination of the other ends of only those optical cables whose one ends define, at the display panel, the legend corresponding to the position of the mask.

**3,643,623**
**METHOD OF AND APPARATUS FOR PURIFYING POLLUTED GASES**
**Joseph W. Eng, Bayside, N.Y., and Stanley C. F. Lin, Matawan, N.J., assignors to Lin Eng Corporation, New York, N.Y.**
**Original application Aug. 30, 1967, Ser. No. 664,416, now Patent No. 3,494,099. Divided and this application Sept. 12, 1969, Ser. No. 870,780**
**Int. Cl. B06b 3/00**
**U.S. Cl. 116—137** **4 Claims**



A method and apparatus for ultrasonically generating fog with a venturi having a converging section, a diverging section and an intermediate restricted throat section through which extends a slot for substantially the entire width thereof and in a plane substantially transverse to the axis thereof. Concurrently water is fed through the throat slot to form a continuously flowing thin sheet of water across the width of the throat section while gas under pressure is fed into the converging section of the venturi wherein the gas is formed into a stream. The gas stream is then fed into the throat section to increase its linear velocity to produce a sound wave which, together with the gas under pressure, moves through said sheet of water flowing across the width of said throat section continually, breaking the sheet of water into fine water droplets having vibrating surfaces. The comingled gas under pressure and the water droplets are then expanded in the venturi divergent section and pass therefrom as ultrasonically generated fog with fine vibrating droplets of water.

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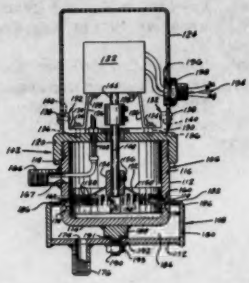
**3,643,624**
**METHOD OF AND APPARATUS FOR PURIFYING POLLUTED GASES**
**Joseph W. Eng, Bayside, N.Y., and Stanley C. F. Lin, Matawan, N.J., assignors to Electro-Sonic Pollution Control Corporation**
**Original application Aug. 30, 1967, Ser. No. 664,416, now Patent No. 3,494,099. Divided and this application Sept. 12, 1969, Ser. No. 870,781**
**Int. Cl. B06b 3/00**
**U.S. Cl. 116—137 A** **8 Claims**

This invention relates to a method of and apparatus for removing contaminants from polluted gases with a low flow resistant, porous, infinite capacity filter in which ultrasonically generated, oscillating fog of substantially increased contact area and contact duration, contacts, absorbs and agglomerates contaminants carried by such gases, and from which the absorbed agglomerated contaminants are removed.

Preferably the fog droplets are charged electrically and activated chemically, as well as generated in a range of sizes



best suited for removing contaminants from the polluted gases.

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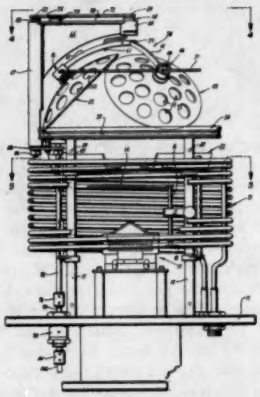
3,643,625

**THIN-FILM DEPOSITION APPARATUS**

Gunard O. B. Mahl, San Francisco, Calif., assignor to Carl Herrmann Associates, Inc., Menlo Park, Calif.

Filed Oct. 7, 1969, Ser. No. 864,377
Int. Cl. C23c *11/02*
U.S. Cl. 118—48 13 Claims



A thin-film deposition apparatus having a holder and a plurality of racks. Each of the racks has a surface which has the conformation of a portion of the surface of a sphere. Means is provided for rotatably mounting the racks on the holder in such a manner that said surfaces of the racks lie generally on the surface of a common sphere. Means is provided for rotating the holder upon an axis centrally disposed with respect to the racks and for rotating the racks about their own axes of rotation with respect to the holder.

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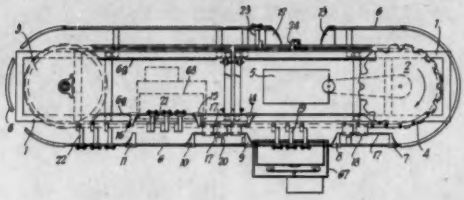
3,643,626

**COATING OF ARTICLES WITH PLASTICS MATERIAL**

Peter Henry McKay, and Morris James Legg, Surrey, both of England, assignors to Plastic Coating Limited, Surrey, England

Filed Jan. 19, 1970, Ser. No. 3,844
Claims priority, application Great Britain, Jan. 23, 1969, 3,991/69
Int. Cl. B05c *3/02*
U.S. Cl. 118—58 10 Claims

An apparatus for coating small articles with plastics material comprises an endless conveyor such as a chain upon which holders for the articles are mounted so that they can tilt laterally of the direction of movement of the conveyor. A heating means such as a gas burner is located adjacent the conveyor to preheat the articles carried by the holders. An open-topped vessel to contain the plastics material is located



adjacent the conveyor downstream of the heating means. Each holder engages with a guide which laterally tilts the holder after it has passed the heating means to introduce the preheated article into the plastics material in the vessel so that the article becomes coated with the plastics material.

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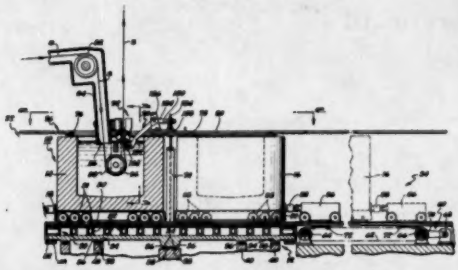
3,643,627

**APPARATUS FOR INTERCHANGING COATING POTS AT A COATING LINE STATION**

King Dwight Killin, Middletown, and Ellis Homer Lieungh, Miamisburg, both of Ohio, assignors to Kaiser Industries Corporation, Oakland, Calif.

Filed July 23, 1970, Ser. No. 57,494
Int. Cl. B05c *3/00*
U.S. Cl. 118—421 14 Claims



An apparatus for positioning coating pots at a coating line station constructed in a deep well such that the top of the coating pots is just below the level of the coating line.

In one embodiment, the two coating pots carried on transfer cars are conveyed through a 180° angle between a working position and hold position by a turntable mounted in the bottom of the well. The coating pot when in the hold position is adapted to be transferred to an adjacent repair area along rails extending radially on and away from the turntable.

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3,643,628

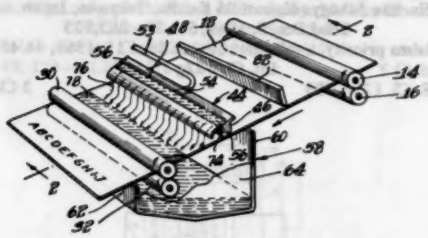
**COMPACT LIQUID TONER APPARATUS WITH STRAIGHT-THROUGH FEED**

Meyer L. Sugarman, and Joseph H. Jaeger, both of c/o Opto/Graphics, Inc. 512 Green Bay Road, Kenilworth, Ill.

Continuation-in-part of application Ser. No. 692,234, Dec. 20, 1967. This application July 11, 1969, Ser. No. 859,219
Int. Cl. B05b *5/02*; B05c *3/02*
U.S. Cl. 118—637 3 Claims

Apparatus for applying a liquid toner only to the surface of a sheet of paper or the like for developing an electrostatic

image thereon, the paper being fed in a rectilinear path, and



the liquid toner being supported on the surface of the paper or the like, with a roller or other means serving as a dam.

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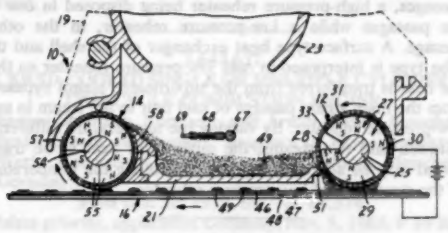
3,643,629

## MAGNETIC POWDER APPLICATOR

Larry G. Kangas, St. Joseph Township, Saint Croix County, Wis., and Robert J. Kline, Grant Township, Washington County, Minn., assignors to Minnesota Mining & Manufacturing, St. Paul, Minn.

Filed Oct. 20, 1969, Ser. No. 867,768
Int. Cl. G03g 13/00
U.S. Cl. 118—637 6 Claims



An applicator for uniformly applying magnetically responsive dry particulate material to broad areas on a web moved past the applicator to deposit the material in pattern areas attracting the material thereto. The applicator comprises an applicating roller having a plurality of magnetic members arranged about a shaft within a rotatable nonmagnetic sleeve to provide a magnetic field around the roller having a feed zone with a radial field changing to a tangential field, an applicating zone with a stronger radial field following the feed zone and a return zone extending from the applicating zone to the feed zone and having a stronger tangential field immediately following the applicating zone. A scavenging roller has a plurality of magnetic members arranged about a rotatable shaft within a nonmagnetic sleeve to carry any free particulate material applied by the applicating roller away from the web surface and back to a tray.

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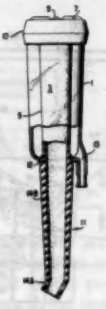
3,643,630

## INFLATION TUBE CONNECTION

Lloyd P. Duncan, Washington, Mo., assignor to Zero Manufacturing Company, Washington, Mo.

Filed Jan. 8, 1970, Ser. No. 1,458
Int. Cl. A01j 05/04
U.S. Cl. 119—14.47 5 Claims

A milking claw assembly has a flexible inflation housed within a shell and the inflation has a thickened hose with a large interior diameter at its lower end. The terminal end of the hose is bent relative to the hose's remainder so that when attached to a bias cut inlet nipple on a milk receiver, the hose sags at its bent portion to close off the inlet and preserve the vacuum when not milking. At the same time the relatively stiff hose firmly fixes the receiver and claw assembly to a cow during milking providing lift and preventing excessive sway of the receiver.



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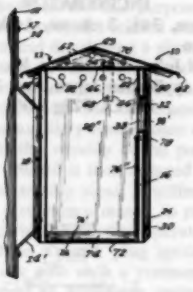
3,643,631

## DOUBLE-WALL INSULATED BIRDHOUSE

Jesse L. Wade, and Arthur E. Vail, both of Griggsville, Ill., assignors to Trio Manufacturing Company, Griggsville, Ill.

Filed Sept. 21, 1970, Ser. No. 74,096
Int. Cl. A01k 31/00
U.S. Cl. 119—23 13 Claims



A metal birdhouse having a double-wall construction open at one end for achieving desirably cooler interior temperature conditions while still using darker, heat-absorbant finishes for exterior wall surfaces. The birdhouse has a ventilated attic and a hingedly mounted roof for access to the interior of the house; a perforate floor; an entrance opening in a sidewall of the house designed to accommodate adapter members for selectively varying the diameter of the opening for restricting the size of bird occupant; a removable drop floor for selectively changing the depth of the interior of the house, and, an internal climbing and drainage aide. Improved ventilation is realized by locating venting openings in upper portions of the birdhouse walls arranged to minimize exposure of the interior to driving rain and other adverse weather conditions.

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3,643,632

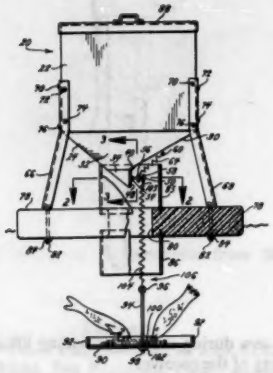
## AUTOMATICALLY OPERATED FEEDING DEVICE

Eugene M. Poirot, Golden City, Mo.

Filed Aug. 28, 1970, Ser. No. 67,751
Int. Cl. A01k 5/02, 64/00
U.S. Cl. 119—54 10 Claims

A feeding device for fish or other aquatic creatures has a feed-dispensing container disposed above the level of the

water, has a feed-supporting tray disposed below the level of the water, and has a yieldable connection between that tray and the valve of that container. That yieldable connection



will permit waves to induce rising and falling of that container relative to that tray without causing excessive release of feed from that container.

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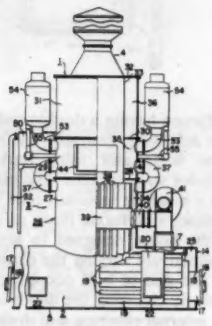
**3,643,633**

## INCINERATOR

Kumakichi Sugano, 346, 3 chome, Asakusabashi, Daito-ku, Tokyo-to, Japan

Filed July 27, 1970, Ser. No. 58,249
Claims priority, application Japan, Apr. 15, 1970, 45/31716
Int. Cl. F23g 5/00
U.S. Cl. 122—2 4 Claims



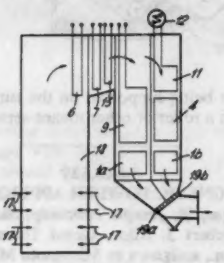
An incinerator comprising a first combustion chamber provided with a hearth. A second combustion chamber is superposed above the first combustion chamber and a flame extinguishing chamber is positioned above the second combustion chamber. The hearth has slanted portions for forming a well offset from alignment with the second combustion chamber and the second combustion chamber is provided with a gate through which material to be incinerated may be fed so as to be preheated as it falls into the first combustion chamber and is directed into the well.

**3,643,634**

## STEAM TEMPERATURE CONTROL SYSTEM

Dohgi Soh, Yokohama-shi, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 8, 1969, Ser. No. 882,993
Claims priority, application Japan, June 11, 1969, 44/45452
Int. Cl. F22g 5/16
U.S. Cl. 122—483 3 Claims



A steam temperature control system for a double reheating, forced circulation steam-generating unit is provided. The heat recover area of said unit is divided into two gas passages, a high-pressure reheater being disposed in one of the passages while a low-pressure reheater, in the other passage. A surface-type heat exchanger of the shell and the tube type is interposed in said low-pressure reheater so that the heat is transferred from the superheated steam bypassed from the main steam passage of said unit to the steam in said low-pressure reheater. By varying the temperature difference between said two steams, the quantity of heat to be transferred may be adjusted, thereby controlling the temperature of the steam in said low pressure reheater.

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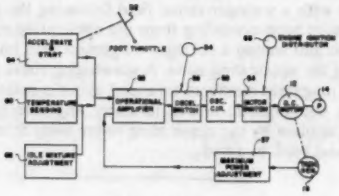
**3,643,635**

## ELECTRONIC FUEL INJECTION SYSTEM

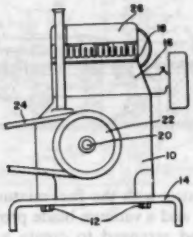
William T. Milam, 4501 Coltrane Road, Oklahoma City, Okla.

Filed Apr. 24, 1970, Ser. No. 31,613
Int. Cl. F02b 3/00; F02d 1/04
U.S. Cl. 123—32 EA 11 Claims



The invention is an electronic fuel injection system for use on internal combustion engines. The fuel is injected into the intake manifold by a variable flow positive displacement pump which varies the amount of fuel flow by varying the motor speed driving the pump. Sensing devices which sense the exhaust gas temperature, movement of the throttle and the r.p.m. of the fuel pump, continually feed signals to the electronic control unit which computes the proper pump speed for an optimum air-to-fuel ratio in accordance with the previously mentioned variable operating factors.

3,643,636
## ENGINE VIBRATION DAMPER
Richard Erwin Miley, and John Gary Meylink, both of Horicon, Wis., assignors to Deere & Company, Moline, Ill.
Filed June 11, 1970, Ser. No. 45,436
Int. Cl. F02b 75/06; F02f 1/30
U.S. Cl. 123—41.69 5 Claims




A vibration damper for a reciprocating internal combustion engine consisting of a weight rigidly mounted externally on the cylinder head of the engine. The weight, a solid mass of high-density, inert material, has a periphery generally conforming to that of the head, and is mounted thereon by means of the same threaded fasteners used to mount the head on the cylinder. The weight is mounted on the cylinder head in spaced relation thereto to serve also as a cooling air shroud.

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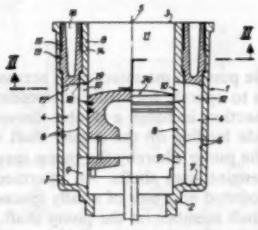
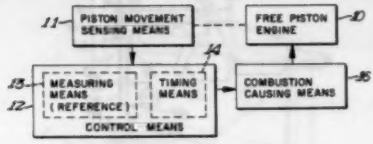
3,643,637
## LIQUID-COOLED SINGLE OR MULTIPLE CYLINDER TWO-CYCLE COMBUSTION ENGINE
Johannes Strossner, Nurnberg, and Armin Drebes, Grossheifendorf, both of Germany, assignors to Firma Zundapp-Werke Gesellschaft mit beschrankter Haftung, Munchen, Germany
Filed Oct. 30, 1970, Ser. No. 85,374
Claims priority, application Germany, Nov. 5, 1969, P 19 55 586.3
Int. Cl. F02f 1/10; F02b 33/04
U.S. Cl. 123—41.72 11 Claims




Liquid-cooled single or multiple cycle two-cycle internal combustion engine produced by mold or die casting, particularly pressure-casting, having a cylinder liner with apertures to the waste gas and transfer port channels, as well as a piston controlling the changes in the load where conically tapering channels are formed in the cylinder block outside the cylinder liner parallel, or nearly parallel, to the longitudinal axis of the cylinder where the lower channel portion forms the transfer port channel and the upper channel portion the cooling water chamber, and both channel portions are tightly sealed relative to one another by an insert member in the area of the passage from the transfer port channel to the combustion chamber of the cylinder.

3,643,638
## FREE PISTON ENGINE IGNITION APPARATUS
Anton Braun, 6421 Warren Avenue, Minneapolis, Minn.
Filed Aug. 24, 1970, Ser. No. 66,385
Int. Cl. F02b 71/00; F02n 17/00
U.S. Cl. 123—46 R 17 Claims




Apparatus and method features are disclosed for initiating combustion in free piston engines in response to a movement-related characteristic of the power piston, such as its rate of change of position in the power cylinder of the engine, so that combustion is caused to occur at a desired time which is related to the time the power piston reverses direction at the start of a power stroke, without regard to variations from one stroke to another in the actual physical position of the power piston along its path of movement in the power cylinder at the moment of piston reversal. Various means are shown or suggested for sensing piston movement and causing combustion in response to changes in the velocity or acceleration of such piston movement at a controlled time interval before or after such velocity drops to zero or after such velocity has reached a maximum, i.e., at or near the moment when the piston reaches its inner dead point in the power cylinder, and preferably somewhat before that moment.

Specific means disclosed for this purpose include means for sensing a desired movement-related characteristic near the end of the stroke and developing a signal dependent, for example, upon the rate of such movement or upon the acceleration of the piston. In one form, an auxiliary piston is moved in synchronism with the movement of the power piston to create, in an auxiliary compression chamber, a pressure signal related to the velocity of the power piston. The pressure signal thus created is then referred to suitable control means where the sensing signal is utilized, for example, by comparison with a reference means, to provide a control force or signal, which is employed to operate a combustion-causing means, such as a spark plug ignition circuit. The reference force for use with such a pressure signal may be obtained by the use of an adjustable spring-biased second auxiliary piston and a controlled orifice. More specifically, the pressure signal created by the first auxiliary piston and cylinder is modified or affected by the rate of flow through the controlled orifice, and the resultant pressure acts on the second auxiliary piston to actuate conventional ignition breaker points against the action of the adjustable spring. The points, in turn, control the delivery of electrical energy to the spark plug. In one embodiment shown, the pressure created by the first auxiliary piston is also used to control the rate of flow through the controlled orifice and thus further determine the point in time at which ignition will be initiated to maintain the proper timing of ignition in spite of variations in the cycle-to-cycle value of power piston velocity or stroke.

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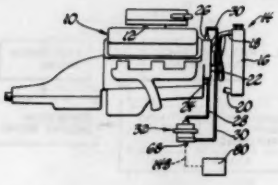
3,643,639
## PRESSURE DIFFERENTIAL SPEED SENSOR
Kenneth C. Bier, Bloomfield Hills, Mich., assignor to Holley Carburetor Company, Warren, Mich.
Filed July 28, 1970, Ser. No. 58,815
Int. Cl. F02d 11/08; F16k 31/385
U.S. Cl. 123—103 E 10 Claims

A pressure differential sensing device has a housing divided into two chambers on opposite sides of a diaphragm contained therein; a first of the two chambers has conduit means adapted for connection to the inlet of a fluid pump

while the other chamber has a first conduit connected to the discharge of the fluid pump and a second conduit leading to some associated device to be controlled thereby; a valve carried by the diaphragm is urged into seating engagement with



the inlet end of the second conduit by a spring so as to prevent communication between the other chamber and the second conduit whenever the differential of pressure between the pump inlet and pump outlet is less than a predetermined magnitude.

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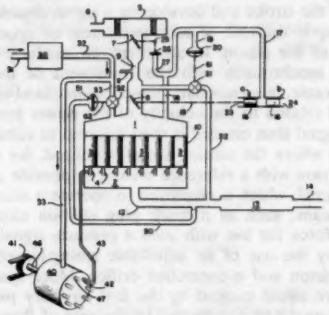
**3,643,640**

## LOW-POLLUTING INTERNAL COMBUSTION ENGINE WHEREIN EXHAUST GASES ARE RECYCLED IN A CONTROLLED PATTERN

**Bernard J. Kraus, Roma-Ostia, Italy, and Dae Sik Kim, Maplewood, N.J., assignors to Esso Research and Engineering Company**

**Filed Feb. 12, 1970, Ser. No. 10,906**
**Int. Cl. F02m** *25/06*
**U.S. Cl. 123—119 A** **7 Claims**



A low-pollution internal combustion engine wherein exhaust gas is recycled by control means only when the engine is operating intermediate idle and full throttle subject to the engine not being choked. A particular feature is the introduction of the recycle exhaust gases intermediate, the point of introduction of the fuel and the flapper valve.

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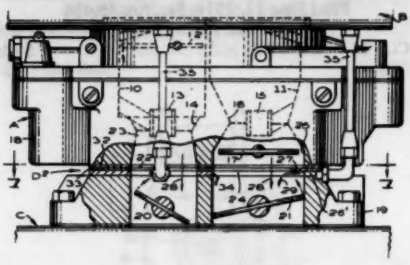
**3,643,641**

## GASKET WITH PASSAGEWAY AND VACUUM BLADE FOR INTRODUCING AIR INTO BARREL OF CARBURETOR

**Ewald A. Busse, 3276 Fair Oaks Avenue, Redwood City, Calif.**

**Filed Apr. 9, 1970, Ser. No. 27,005**
**Int. Cl. F02m** *25/06, 23/00*
**U.S. Cl. 123—119 A** **4 Claims**

A gasket body formed with an opening disposed in registration with the bore of a carburetor barrel so that the fuel mixture will pass therethrough on its way to an intake manifold, the gasket body having an air inlet passageway leading from a source of air to the gasket opening and through which additional air may be conveyed to the carburetor for intermixing with the fuel mixture for leaning down the air-fuel ratio, and a vacuum blade projects into the gasket body opening and arranged to create a vacuum in the air inlet passageway for drawing in the additional air.



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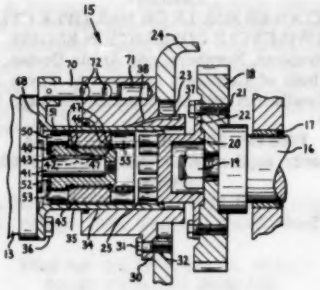
**3,643,642**

## POWER TAKEOFF ON MARINE DIESEL ENGINE

**Norman E. Junes, Route 3, Box 148, Astoria, Oreg.**

**Filed July 6, 1970, Ser. No. 52,641**
**Int. Cl. F02b** *77/00;* **F16d** *11/04, 3/48*
**U.S. Cl. 123—198 C** **7 Claims**



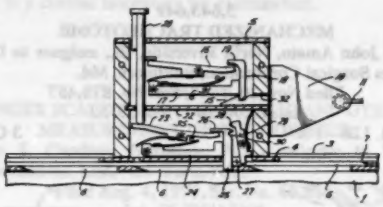
A hydraulic pump is mounted as an accessory on a marine diesel engine to operate hydraulic equipment on a boat. The driving connection includes a double universal joint which eliminates side loading on the engine shaft which is utilized for driving the pump whereby the pump may be driven from one of the engine cam shafts. An intermediate member is resiliently mounted on a pair of axially spaced rubber O-rings on a driven hub member on the pump shaft. One end of the intermediate member is equipped with a circle of axial pins which fit loosely in a circle of holes in the hub member to provide one of the universal joints. A driving member bolted to the engine cam gear has a circle of axial pins which fit loosely in a circle of holes in the other end of the intermediate member to form a second universal joint. The hub member and intermediate member are mounted in a sleeve for axial sliding movement in a housing bolted to the engine housing. The pump is mounted on the sleeve. By sliding the pump and sleeve bodily toward the engine, the last named pins and holes cooperate as a dental clutch to drive the pump. By sliding the pump bodily away from the engine, the last named pins and holes are disengaged from each other to declutch the pump. This sliding movement is effected by a hand lever and a spring detent is provided to hold the clutch parts in engaged and disengaged positions.

3,643,643

## BOW OR ELASTIC DEVICE FOR PROPELLING PROJECTILES

Clarence C. Jordan, Box 224, Splendora, Tex.

Filed Sept. 29, 1969, Ser. No. 861,870
Int. Cl. F41b 5/00, 7/00
U.S. Cl. 124—20 R 5 Claims



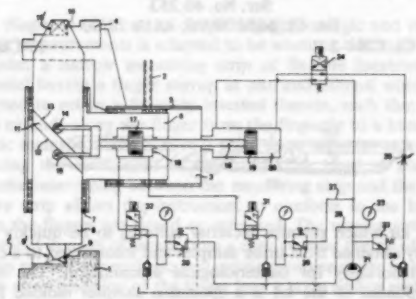
A device for launching missiles, such as rocks, steel balls, or arrows, having an adjustable lock and a novel triggering mechanism, mounted on a support, the rock or ball-launching mechanism having a missile pocket secured to the power unit by swivel connections and having a trigger-receiving latch mounted thereon, said triggering mechanism providing means for triggering the missile launch and for releasing the lock for readjustment, in sequence both the latch mechanisms are in the same housing and the lock engages the pocket member and the latch engages the base member.

3,643,644

## TEMPLATE COPYING DEVICE FOR MACHINE TOOLS

Adino Nadalini, Padova, Italy, assignor to Soc. Az. Industrie Meccaniche Padovane Saimp, Padova, Italy

Filed Feb. 9, 1970, Ser. No. 9,918
Claims priority, application Italy, Feb. 11, 1969, 12706 A/69
Int. Cl. B24b 53/08; B23b 3/28
U.S. Cl. 125—11 11 Claims



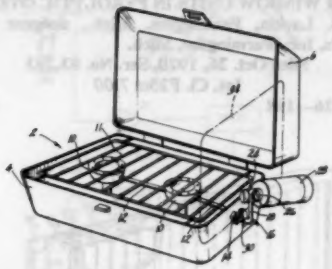
Device for working with a template, for lathes and grinding machines, in which a control support advances with continuous motion parallel to the axis of the machine, the tool is carried by a first slide of a pair of slides connected with the advancing support, one slide being movable parallelly to the axis of advance and the other being movable perpendicularly, said first slide being mounted on the other slide and being connected to it and to the advancing support through a rectilinear guide and follower, in which the guide is rigidly connected to the first slide and is oriented at 45° while the follower is rigidly connected to the advancing support.

3,643,645

## VAPORIZING FITTING FOR PROPANE STOVE

Raymond E. Benson, Forest Park, Ill., assignor to Olin Corporation

Filed Dec. 7, 1970, Ser. No. 95,669
Int. Cl. F24c 5/20
U.S. Cl. 126—38 4 Claims



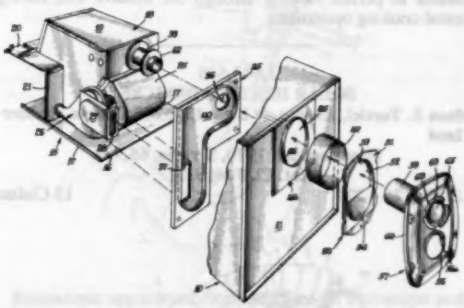
A fitting for use with relatively flat and compact camping stoves and the like using bottled liquid propane for fuel. The fitting supports the fuel cylinder and holds it at an angle with the horizontal so that the liquid propane will settle at the bottom of the cylinder and propane vapors will rise to the top of the cylinder to be withdrawn therefrom to fuel the stove.

3,643,646

## FLUE EXHAUST AND COMBUSTION AIR INTAKE ASSEMBLY FOR UNDERCOUNTER FURNACE

Bernard G. Honaker, Jr., Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Oct. 14, 1970, Ser. No. 80,605
Int. Cl. F23j 11/00; F24c 3/00; F24h 3/00
U.S. Cl. 126—85 B 10 Claims



The backwall of an outer casing for a sealed-combustion furnace is provided with an opening aligned with a similar opening through the wall. A vent hood having an upper exhaust opening and a lower intake opening are adapted for mounting on the exterior of the wall. An exhaust tube connects the exhaust opening of the vent hood with the hot air flue of the furnace; and a frustum is provided at the exhaust opening on the vent hood which flares outwardly to define a base at the vent exhaust opening which has an area slightly greater than the cross-sectional area of the exhaust tube to cause the forced exhaust gases to curl about it after exiting the exhaust opening for mixing with outside gases before rising thereby reducing the temperature of the surrounding wall portion and reducing recirculation of the spent combustion gases. A curved baffle about the upper part of the intake opening also reduces recirculation under certain downward

wind conditions. A thin intake conduit is formed on the inside back wall of the furnace casing which sealing communicates the annular intake space about the exhaust tube with an inlet to the fresh air blower.

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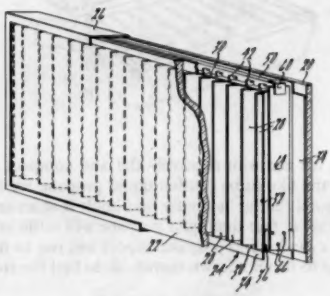
**3,643,647**

## THERMOSTATICALLY CONTROLLED HEAT SHIELD FOR WINDOW UNITS IN PYROLYTIC OVENS

**Robert B. Larkin, Farmington, Mich., assignor to Mills Products, Inc., Farmington, Mich.**

**Filed Oct. 26, 1970, Ser. No. 83,793**
**Int. Cl. F23m 7/00**
**U.S. Cl. 126—198** **9 Claims**



A window unit for use in the oven door of a self-cleaning oven comprising a pair of spaced glass panels separated by a spacer and clamped together by a peripheral clamping flange with a series of pivoted louvers disposed between the glass panels and supported at their opposite ends by the spacer, and a thermally responsive actuator for automatically pivoting the louvers to a closed position to prevent radiation of excessive heat to the outer glass panel when the oven is on the cleaning cycle. The louvers are automatically opened by the actuator to permit viewing through the window unit during normal cooking operations.

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**3,643,648**

## SOLAR HEATING DEVICES

**Adnan S. Tarcici, Avenue de Bude 13, 1200 Geneva, Switzerland**

**Filed Aug. 21, 1970, Ser. No. 65,938**
**Int. Cl. F24j 3/02**
**U.S. Cl. 126—270** **13 Claims**

A solar heating apparatus comprises a post, a collapsible tripod for holding the post perpendicular to a supporting surface and a frame universally mounted on the post. A pair of reflectors are mounted on the frame, each reflector comprising a plurality of sector-shaped segments pivotally joined at one end and alternate segments being interconnected by a flexible tape so that they can be collapsed in a superposed storage position and expanded with a fanlike movement to form a semiparabolic reflector. Means on the frame enable adjustment of the focal points of the reflectors. A second post is fixed, pivotally or otherwise, to the first post to enable an object to be held in the vicinity of the focal points of the reflectors. The frame can form a case for storage of the device.

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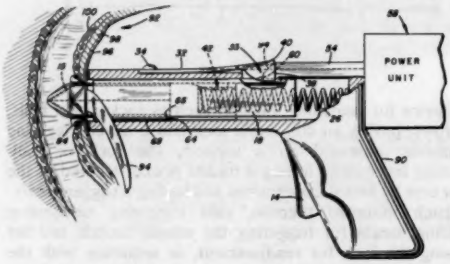
**3,643,649**

## MECHANIZED TRACHEOTOME

**Joseph John Amato, North Riverside, Ill., assignor to United States Surgical Corporation, Baltimore, Md.**

**Filed Nov. 20, 1969, Ser. No. 878,457**
**Int. Cl. A61b 17/00, 17/10**
**U.S. Cl. 128—1 R** **3 Claims**




A tracheotome for the mechanized performance of a tracheostomy. The inventive tracheotome, upon triggering, makes an incision through the skin, fascia and trachea of the patient. Then, after the incision has been made, a delayed-action plunger is activated and serves to bend a staple which maintains the opening in the trachea.

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**3,643,650**

## METHOD AND APPARATUS FOR OBTAINING BACTERIOLOGICAL INFORMATION

**Harvey A. Elder, 11577 Acacia Street, Loma Linda, Calif.**

**Continuation-in-part of application Ser. No. 744,279, June 10, 1968, now abandoned. This application May 25, 1970, Ser. No. 40,253**
**Int. Cl. B65d 79/00; A61b 10/00**
**U.S. Cl. 128—2 R** **13 Claims**

A kit which permits bacterial cultures to be quickly and easily obtained from urine samples and transmitted to a clinical laboratory for bacteriological examination. The main component of the kit is a specimen sampler molded from clear plastic in the form of a jointed strip. The strip has symmetrical, longitudinal half-segments integral with a central joint segment through which the half-segments are movable relative to one another. The half-segments have two bowllike indentations with outwardly bulging walls which serve as deposit areas for beds of congealed culture medium. Melded to the bottoms of the bowllike indentations are four shallow cups with flaring rims, around which the beds of congealed culture medium are formed and which serve to anchor the beds in place, and hold them intact, during usage of the specimen sampler. The sampler is designed so that its two half-segments can be folded together until the bottoms of their bowllike indentations touch and their open fronts face

outwardly in opposite directions. The sampler has a pair of finger grip indentations either side of its joint segment. The kit includes, in addition to the specimen sampler, a narrow, sealable container into which the folded sampler snugly fits. When the sampler is ready for use, it is pulled from the container by means of the finger grip indentations, then held by these indentations and dipped into a sample of urine until its culture bed areas are immersed. The sampler is then removed from the urine and sealed in the container for transmittal to a clinical laboratory for examination.

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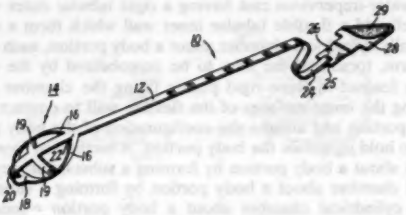
**3,643,651**
**FINGER SCALE FOR GYNECOLOGIC AND OTHER MEASUREMENT OF BODY ORIFICE**
**Alvaro J. Cuadros, Hartsdale, N.Y., assignor to Lorton Laboratories, Ltd., New York, N.Y.**
**Filed Aug. 4, 1970, Ser. No. 60,815**
**Int. Cl. H61l 5/00**
**U.S. Cl. 128—2 S** **9 Claims**



A diagnostic instrument for taking gynecologic and other pelvic measurements is adapted to be worn on the hand and includes a narrow measuring strip of flexible inextensible material having a finger stirrup at one end thereof which is adapted to retain a fingertip inserted therein, such that the strip extends along the finger from the fingertip to a band of elastic material which in turn is fixed to an adhesive strip for securing the instrument to the hand. The band of elastic material intervening between the measuring strip and the adhesive strip allows the instrument to conform to the hand when the fingers are flexed or extended. The narrow strip is calibrated in units of length from a zero point at the tip of the stirrup so that gynecologic and pelvic measurements may be taken upon insertion of the finger into a body orifice such as the vagina.

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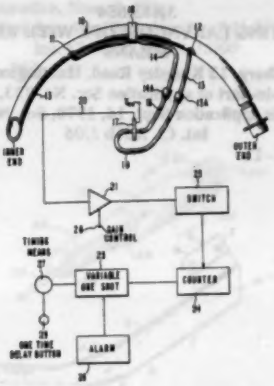
**3,643,652**
**MEDICAL BREATHING MEASURING SYSTEM**
**Delfin J. Beltran, 2364 Bryant Street, Palo Alto, Calif.**
**Filed Dec. 31, 1969, Ser. No. 889,465**
**Int. Cl. A61b 5/08**
**U.S. Cl. 128—2.08** **6 Claims**

A tube for measuring respiratory gas flow of a mammal, including a tube which fits into the mammal's trachea and a pair of ports spaced along its length. A pair of transmitting tubes are connected to the ports and the differential pressure measured across the free ends of the transmitting tubes in




order to obtain an indication of the respiratory gas flow rate through the tube in the mammal's trachea.

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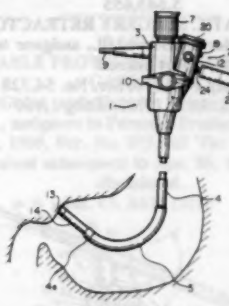
**3,643,653**
**ENDOSCOPIC APPARATUS**
**Nagashige Takahashi, and Kunio Kinoshita, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Shibuya-ku, Tokyo, Japan**
**Filed Dec. 19, 1969, Ser. No. 886,552**
**Claims priority, application Japan, Dec. 24, 1968, 43/94475**
**Int. Cl. A61b 1/06**
**U.S. Cl. 128—6** **8 Claims**



Endoscopic apparatus comprising a major endoscope and a minor endoscope adapted to be inserted in the major endoscope and capable of viewing on a magnified scale an object sought by the major endoscope. The forward end portion of the minor endoscope is provided with a cylindrical wall extending forwardly therefrom so that, by contacting the front end edge of the cylindrical wall with the object, the forward end portion of the minor endoscope can be firmly secured relative to the object, while a sharp image of the object can be properly observed on a magnified scale through an objective lens provided in the forward end portion by virtue of the proper spacing of the objective lens from the object by means of the cylindrical wall extending forwardly from the forward end portion of the minor endoscope. In order to positively fix the forward end portion in position relative to the object, the front end edge of the cylindrical wall may be provided with a plurality of pricking needles which prick the object when the cylindrical wall contacts the object or vacuum may be introduced into the hollow space defined by

the cylindrical wall between the object and the front end of the objective lens.

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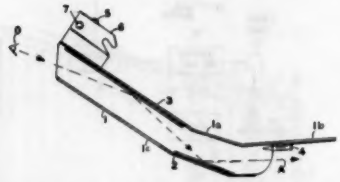
**3,643,654**
**ILLUMINATING LARYNGOSCOPE WITH REFLECTING MEANS**

**Hector R. Felbarg, 12 Kingsley Road, Huntington, N.Y.**
**Continuation-in-part of application Ser. No. 733,394, May 31, 1968. This application Sept. 14, 1970, Ser. No. 72,044**
**Int. Cl. A61b *1/06***
**U.S. Cl. 128—11** **1 Claim**



A laryngoscope of the type comprising a tubelike member of U-shaped cross section, open on one side and having a light source at the end thereof. The member has a flattened bend having an interior angle of more than 90°. A first mirror is mounted on the bottom interior of the tubular member in the area of the bend and a second mirror is mounted on the upper interior of the tubular member near the operator's end so that the operator can look at the second mirror and see a right-side-up image of the throat and larynx at the end of the blade.

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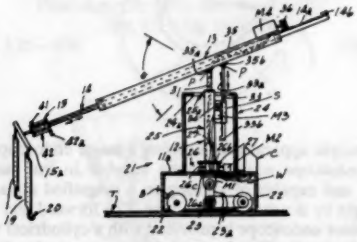
**3,643,655**
**AUTOMATIC SURGERY RETRACTOR**

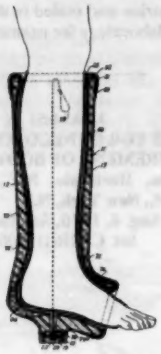
**Anthony Peronti, Morton Grove, Ill., assignor to Michael S. White, Chicago, Ill., a part interest**
**Filed July 14, 1970, Ser. No. 54,728**
**Int. Cl. A61b *17/02*; A61g *13/00***
**U.S. Cl. 128—20** **12 Claims**



An automatic surgery retraction apparatus which is self-supporting away from an operating table or a patient and is selectively positionable along both. The apparatus includes a vertically extensible upright assembly mounted for rotation about a base member and a horizontally extensible boom assembly mounted for pivotal movement about the upright assembly. The upright and boom assemblies are provided with electronic precision servo-positioning systems allowing remote actuation thereof for precise and accurate positioning. The boom assembly is provided with one or more disposable strap members carrying retraction instruments, which may also be disposable.

**3,643,656**
**INFLATABLE SURGICAL CAST**

**Joseph V. Young, Route 2, Box 90A, Lewisville, Tex., and Richard M. Johnson, 3815 Weeburn Drive, Dallas, Tex.**
**Filed June 16, 1969, Ser. No. 833,355**
**Int. Cl. A61f *5/04***
**U.S. Cl. 128—90** **10 Claims**



A water-impervious cast having a rigid tubular outer wall or shell and a flexible tubular inner wall which form a substantially cylindrical chamber about a body portion, such as a leg, arm, torso and the like, to be immobilized by the cast and a foamed-in-place rigid plastic filling the chamber and causing the inner surfaces of the flexible wall to contact the body portion and assume the configuration of the body portion to hold immobile the body portion. A method of forming a cast about a body portion by forming a substantially cylindrical chamber about a body portion by forming a substantially cylindrical chamber about a body portion closed at both ends and having an inner flexible wall movable into engagement with the body portion and introducing a foam-producing substance into the cylindrical chamber to cause it to foam and expand and move the flexible wall into engagement with and to conform to the shape of the body portion while the body portion is immobile.

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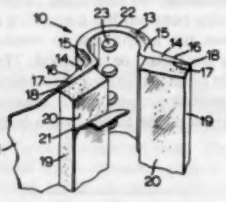
**3,643,657**
**SPACER FOR SURGICAL CAST**

**Francis Whyte, 2 Cascade Drive, Halifax, Nova Scotia, Canada**
**Filed June 1, 1970, Ser. No. 41,830**
**Int. Cl. A61f *5/04***
**U.S. Cl. 128—91 R** **2 Claims**



A spacer, for use in forming a surgical cast of hardenable material, consisting of an elongated, laterally arcuate central rib with flanges projecting outwardly from the lateral edges of the central rib and tapering to their free edges. The spacer is made of form-retaining, severable material. A cast is made by using one or more slabs of malleable, hardenable material having its lateral edges overlying the flanges of one or more spacers and contiguous with the central rib.

3,643,658

## IMPLANTS OF TITANIUM OR A TITANIUM ALLOY FOR THE SURGICAL TREATMENT OF BONES

Samuel Steinemann, Liestal, Switzerland, assignor to Institute Dr. Ing. Reinhard Straumann, Waldenburg, Switzerland

Filed Aug. 27, 1969, Ser. No. 869,428
Claims priority, application Switzerland, Sept. 3, 1968, 13217/68
Int. Cl. A61f 5/04
U.S. Cl. 128—92 D 2 Claims

A titanium or titanium implant with the novel feature of the surface layer formed as an oxide, nitride, carbide and carbonitride. The surface layer is applied to prevent abrasion and corrosion of the implant and to prevent fretting between contacting implants as well as to improve the appearance thereof.

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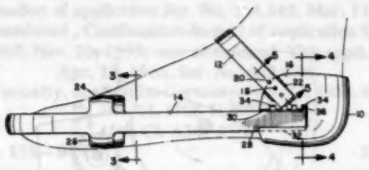
3,643,659

## TOE GUARD

Arthur J. Storer, Mackay, Idaho

Filed June 20, 1969, Ser. No. 835,061
Int. Cl. A61f 5/30
U.S. Cl. 128—153 2 Claims



A toe guard, for supporting bedding or other covering, which is worn on the foot in the manner of a sandal. A heel cup with a retaining strap holds the guard in place and an adjustable guard band of straplike, open loop form encompasses that part of the foot forward of the heel. Actual contact of the guard with the foot is minimized to avoid discomfort.

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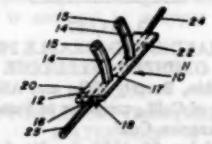
3,643,660

## NASAL CANNULA

Allan C. Hudson, 3323 Sparr Boulevard, Glendale, Calif.; John M. Kinnear, 20515 San Gabriel Valley Drive, Walnut, Calif., and Harold R. Havstad, 6612 Centralia, Lakewood, Calif.

Filed Nov. 21, 1969, Ser. No. 878,628
Int. Cl. A61m 15/08
U.S. Cl. 128—206 13 Claims



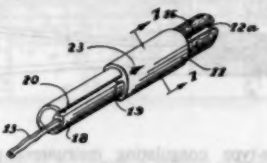
A unified nasal cannula comprises a hollow tubular body having an upper flat or plane surface and a pair of spaced and curved elongated tubular extensions, having exterior orifices for directing a gas flow which extensions project upwardly at an angle from the surface.

3,643,661

## TAMPON FOR DIRECTIONAL PLACEMENT AND APPLICATOR THEREFOR

Joseph R. Crockford, Flushing, N.Y., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed July 15, 1969, Ser. No. 841,879
Int. Cl. A61f 13/20, 15/00
U.S. Cl. 128—263 15 Claims



A catamenial tampon designed for directional placement in the vaginal cavity. The tampon is made of an oblong pledget of absorbent material, compressed into thin, flat, self-sustaining, resilient sheet form and folded longitudinally on itself in symmetrical segments to form an elongate body of substantially circular cross section of a size suitable for insertion in the vaginal tract. The folds are arranged to form at least one longitudinal groove in the tampon body. The folded tampon, which tends to spring back to flat form unless restrained, is held in its folded form within a tubular applicator which has at least one longitudinal rib in mated and slidable relationship with the longitudinal groove of the tampon, and which has a telescoping ejector disposed in one end. The applicator tube has indicia to show the radial disposition of the tampon within the tube in order to facilitate placement of the tampon in a predetermined position by the user.

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3,643,662

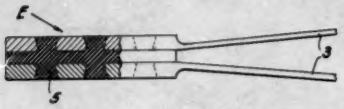
## REMOVABLE PROTECTIVE LINER FOR NETHER GARMENTS

Mary H. McGuire, and Chandra Kapur, both of East Brunswick, N.J., assignors to Personal Products Company

Filed Nov. 4, 1969, Ser. No. 873,865. The portion of the term of the patent subsequent to Apr. 20, 1988, has been disclaimed.
Int. Cl. A61f 13/16
U.S. Cl. 128—287 9 Claims

A protective liner which is temporarily, but securely, held to the interior crotch portion of nether garments by a narrow, double-faced, pressure sensitive adhesive tape provided on the under surface of the liner. The adhesive tape possesses differential adhesion levels such that the adhesive layer that secures the tape to the protective liner possesses a greater level of adhesion so as to permanently adhere the tape thereto, than does the adhesive layer of the tape that temporarily, but securely, adheres the tape and the liner to the crotch portion of the nether garment.

3,643,663
COAGULATING INSTRUMENT
Hermann Sutter, Wildtal near Freiburg, Germany, assignor to F. L. Fischer, Freiburg am Martinstor, Freeburg. Germany
Filed Oct. 15, 1969, Ser. No. 866,477
Claims priority, application Germany, Oct. 16, 1968, P 18 03 292.3
Int. Cl. A61b 17/36
U.S. Cl. 128—303.17 8 Claims



A forceps-type coagulating instrument provided with means for electrically connecting the relatively insulated blades of a forceps to a generator supplying a high-frequency voltage, for the purpose of coagulating a part held between the points of the blades of the forceps, wherein said connecting means are constituted by a push-on and pulloff connector.

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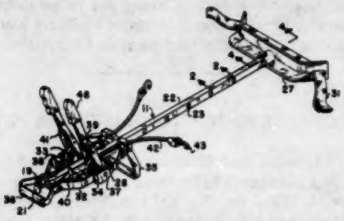
3,643,664
DUAL-PULL VETERINARY FETAL EXTRACTOR
Robert L. McMillan, 133 Winn Avenue, Box 2189, Universal City, Tex.
Filed Apr. 1, 1970, Ser. No. 24,706
Int. Cl. A61b 17/42; A61d 1/08
U.S. Cl. 128—353 8 Claims



A veterinary obstetric instrument for assisting the birth of fetal animals to avoid the necessity of caesarian operations. The construction of the device comprises a quick-release progressively locked telescoping body portion, a breeching plate and belt for attaching the device to an animal, a ground support member and a positioning handle, dual cables mounted on lever-driven ratchet reels rotatably mounted on a reel bracket, and chain or cable means for attaching the reel mounted cables to the head or body portion of the fetal animal.

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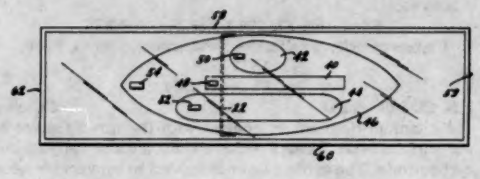
3,643,665
THERAPEUTIC PACK FOR THERMAL APPLICATIONS
James C. Caillouette, Pasadena, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.
Filed Apr. 4, 1969, Ser. No. 813,491
Int. Cl. A61f 7/04
U.S. Cl. 128—403 8 Claims

A therapeutic pack containing chemicals to produce a temperature-changing chemical reaction, e.g. endothermic or exothermic. The chemical components for the reaction are held spaced apart within a bag by a fracturable means, e.g. a diaphragm. The bag incorporates an insulation cover, e.g. minutely expanded polystyrene paper and aluminum foil, various portions of which may be selectively removed to provide an effective heat-transfer path of a predetermined size, to accomplish the desired therapeutic treatment.



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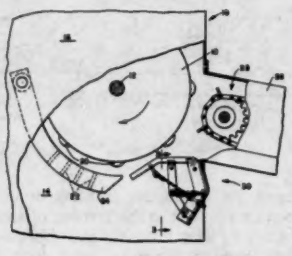
3,643,666
STONE GUARD FOR COMBINES
Henry Hoyt Denison, Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed Jan. 30, 1970, Ser. No. 7,002
Int. Cl. A01f 12/20
U.S. Cl. 130—27 JT 15 Claims



A plurality of adjacent fingers form a door which extends fore-and-aft between the lower edge of the crop inlet opening in a combine body and the front edge of the concave. The door is composed of three individual sections, each of which is mounted on a transverse pivot adjacent the crop inlet opening and adapted to swing downwardly when a rock or like object is introduced between one of the sections of fingers and the threshing cylinder, thereby allowing such objects to fall away before entering the area between the cylinder and concave. A spring acting through a toggle-type linkage urges each of the finger sections upwardly against an adjustable stop, the linkage being so arranged that the urging force transmitted to the sections diminishes rapidly as the sections swing downwardly. The shape of the fingers is such that an entering rock will trip the mechanism a substantial distance forwardly of the leading edge of the concave.

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3,643,667
METHOD OF MAKING A SMOKABLE PRODUCT FROM OXIDIZED CELLULOSE
Theodore S. Briskin, Beverly Hills, and Allen H. Remanick, Pasadena, both of Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.
Filed Jan. 22, 1970, Ser. No. 5,098
Int. Cl. A24d 01/18
U.S. Cl. 131—2 14 Claims

A method for preparing a smokable product wherein a cellulosic material is first selectively oxidized with a gaseous nitrogen dioxide, and the resulting oxidized cellulosic material is thereafter subjected to a reduction reaction by means of a borohydride at an alkaline pH.

## 3,643,668
## OXIDIZED CELLULOSE SMOKING PRODUCT COMPOSITION

**Theodore S. Briskin, and Geoffrey R. Ward, both of Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.**

**Continuation-in-part of application Ser. No. 802,229, Feb. 25, 1969, now Patent No. 3,559,655, Continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, now Patent No. 3,447,539, Continuation-in-part of application Ser. No. 674,994, Oct. 12, 1967, now abandoned. This application Aug. 12, 1969, Ser. No. 849,497**

**Int. Cl. A24b** *15/02*

**U.S. Cl. 131—2** **3 Claims**

A smoking product is disclosed which comprises a charge of oxidized cellulosic material in combination with a treating agent which is designed to enhance the aroma evolved from the burning of the oxidized cellulose by masking undesirable residual odors. The treating agents which have been found to be effective are long fatty aldehydes containing 9–18 carbon atoms, 3,7,-dimethyl-2,6-octadienol, methylheptyne carbonate, ethyl glyoxalate, sandalwood oil and amyris oil.

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## 3,643,669
## TOBACCO ROD FORMING MACHINE

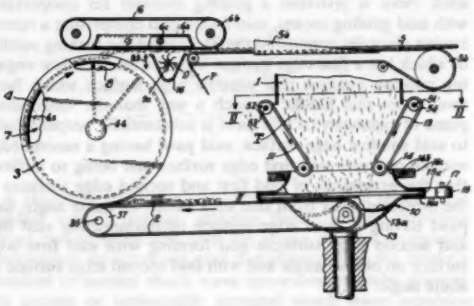
**Kurt Korber, Hamburg-Bergedorf, Am Pfingstberg 10, Germany**

**Continuation of application Ser. No. 264,145, Mar. 11, 1963, now abandoned , Continuation-in-part of application Ser. No. 852,060, Nov. 10, 1959, now abandoned. This application Apr. 18, 1966, Ser. No. 543,438**

Claims priority, application Germany, Nov. 12, 1958, H 34791; Dec. 11, 1958, H 35078

**Int. Cl. A24c** *05/18*

**U.S. Cl. 131—84 C** **3 Claims**



An automatic cigarette making machine wherein tobacco shreds are showered from a hopper through a guide and onto the upper stretch of a narrow elongated collecting tape which accumulates a stream containing a surplus of tobacco. Such stream is transferred into the circumferential groove of a suction wheel and is trimmed to remove the surplus prior to delivery to a horizontally extending rod former wherein the trimmed stream is enclosed in wrapper tape to form a cigarette rod.

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## 3,643,670
## APPARATUS FOR LIQUID TREATMENT OF FLAT MATERIALS

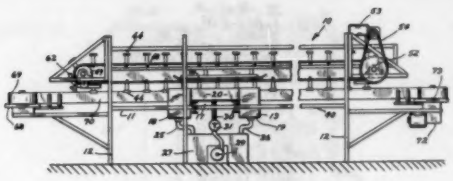
**Winston E. Sabatka, Lakeville; Wilburn M. Bloomquist, Minneapolis, and Raymond W. Reinke, Rosemount, all of Minn., assignors to Finishing Equipment and Supply Co., Inc., Bloomington, Minn.**

**Filed Aug. 20, 1970, Ser. No. 65,467**

**Int. Cl. B05c** *3/10, 11/14;* **B08b** *3/04*

**U.S. Cl. 134—117** **12 Claims**

Plating or etching or other immersion treatment of lower portions only of horizontally fed, vertical positioned thin strips and arrays of workpieces is accomplished by recirculating electrolyte or the like through a bathtub provided with vertical slots to receive and discharge such workpieces. The rate of recirculation is such that an effective plating height well above the bottom of the vertical bathtub slots is maintained. A plurality of horizontally moving clamps support the workpieces and are electrically connected thereto as the workpieces move into, through, and out of the bathtub. These clamps are also electrically slidably connected to bus bars to form part of a complete electroplating circuit.



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## 3,643,671
## APPARATUS FOR TREATING ELEMENTS OF CIRCULAR OUTLINE

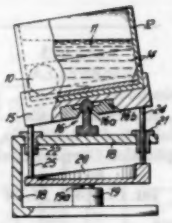
**Karin Henninges, Stuttgart, and Bernd Schulze, Benninger, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Original application Dec. 5, 1968, Ser. No. 781,315. Divided and this application June 19, 1970, Ser. No. 47,805**

Claims priority, application Germany, Dec. 14, 1967, P 16 21 428.1

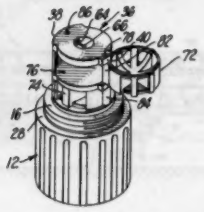
**Int. Cl. B08b** *3/08, 11/02*

**U.S. Cl. 134—118** **5 Claims**



An apparatus for treating elements of circular outline. A vessel is provided with guide grooves which are either straight and parallel to one another or are torus shaped and concentric with one another. The vessel is mounted for tilting movement about a ball-and-socket joint and accommodates a bath of etching fluid. Disc-shaped elements to be treated are supported on edge in the respective guide grooves. A motor is mounted below the vessel and its output shaft drives a can follower having at least one ascending and at least one descending surface portion, and in the case of straight parallel guide grooves two rod-shaped follower members are mounted for sliding movement in axial direction of the motor shaft with their lower ends resting on the can disc surface and their upper ends engaging the bottom wall of the vessel so that, when they are shifted in axial direction of the motor output shaft, the vessel is tilted alternately to one side and the opposite side about the ball-and-socket joint. If the guide grooves are torus shaped, then three such follower members are used which are circumferentially spaced about the axis at equiangular locations.

3,643,672
**CONTACT LENS CASE**
Frank E. Brown, 1842 Emerald Terrace, Glendale, Calif.
Filed Mar. 2, 1970, Ser. No. 15,755
Int. Cl. B08b *3/04, 11/02*
U.S. Cl. 134—143 9 Claims



A case for storing and cleaning contact lenses, comprising: a container having an open end; a closure for the open end of the container; a receptacle carrier movable from a retracted position within the container to an extended position wherein it projects from the open end of the container; interengageable annular shoulders on the container and the carrier for limiting outward movement of the carrier and for closing the open end of the container to prevent loss of liquid therefrom when the carrier is in its extended position; a spring biasing the carrier toward its extended position; and two lens receptacles pivotable relative to the carrier, when the latter is extended, from aligned retracted positions to extended positions wherein the interiors of the receptacles are accessible for insertion or removal of contact lenses, the receptacles being pivotable about a common axis spaced laterally from and parallel to the central axis of the container. With the foregoing construction, the container is automatically sealed against loss of liquid therefrom when the carrier is extended, whereupon the lenses in the receptacles mounted on the carrier may be washed readily without any loss of liquid from the container.

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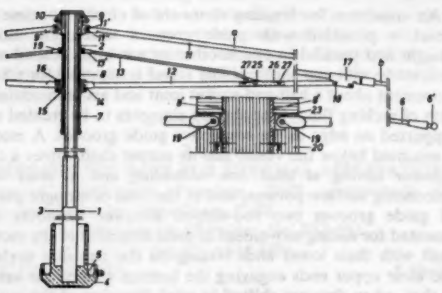
3,643,673
**UMBRELLA**
Heinz Weber, Rhineland, Germany, assignor to Telesco Brophey Limited, Montreal, Canada
Filed July 16, 1970, Ser. No. 55,349
Claims priority, application Germany, July 25, 1969, P 19 37 891.7
Int. Cl. A45b *25/04*
U.S. Cl. 135—20 5 Claims



An injection molded runner for an umbrella with an integrally pivoted shaft to which a stretcher member is pivoted.

3,643,674
**POCKET UMBRELLA WITH THREE-SECTIONAL STICK**
Gunter Granrath, Solingen, Germany, assignor to Kortenbach & Rauh Kommanditgesellschaft, Solingen-Weyer, Germany
Filed Sept. 11, 1969, Ser. No. 856,973
Claims priority, application Germany, Jan. 11, 1969, G 69 00 937
Int. Cl. A45b *19/04, 25/08*
U.S. Cl. 135—25 4 Claims

A multisectional umbrella frame having a stick section with a handle and having an intermediate stick section with a window located at the lower end of said intermediate stick section when the umbrella frame is in its unfolded position of use, in which that stick section which has the handle connected thereto is provided with guiding means, e.g. in the form of a longitudinal groove, arranged below said window while in use position of said stick between the lower edge of said window and the lower edge of the intermediate frame stick there is provided a guiding member for cooperation with said guiding means, said frame also comprising a runner having pivotally connected thereto a pawl the locking section of which has a first edge surface which in said window engaging position engages that window edge surface which faces away from said handle in such a way that the longitudinal plane of symmetry of said pawl is substantially perpendicular to said window edge surface, said pawl having a second edge surface opposite said first edge surface and being so inclined that the extensions of said first and second edge surfaces in the direction away from said stick define an acute angle, said pawl having a third edge surface interconnecting said first and second edge surfaces and forming with said first edge surface an obtuse angle and with said second edge surface an acute angle.

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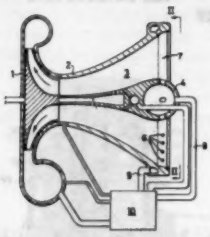
3,643,675
**METHOD AND DEVICE FOR PROVIDING A CONTROL OF THE VELOCITY PROFILE OF THE WORKING MEDIUM IN THE INLET OF FLOW MEDIUM**
Lennart Wetterstad, Storegardsuagen 27, Trollhattan, Sweden
Filed Jan. 2, 1970, Ser. No. 307
Int. Cl. F15d *1/02*
U.S. Cl. 137—13 21 Claims

A method and apparatus for controlling the velocity profile of the working medium of fluid actuated or fluid impelling mechanisms, such as water and gas turbines, turbopumps, compressors, etc., having radial or axial flow patterns in which a control fluid of the same character as the working fluid is introduced tangentially into the working fluid at the working fluid inlet to impart a rotational motion to the working fluid either in the same direction as the direction of rotation of the rotor of the mechanism or in a direction opposite to the direction of rotation of the rotor, and at a substantial distance forward of the rotor, with respect to the direction of flow of working fluid, and the rotational movement is then amplified by restricting the flow path of the working fluid

prior to its contact with the rotor. Preferably, the control fluid is introduced through a plurality of orifices or nozzles distributed along radially disposed conduits in the working fluid inlet and the control fluid is obtained from the outlet of



the machine or from both the outlet and an external source and is passed through a control apparatus, such as a fluid amplifier system, to control the volume, pressure and distribution through the orifices or nozzles.

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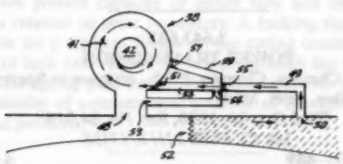
3,643,676

## SUPERSONIC AIR INLET CONTROL SYSTEM

Charles R. Limage, Dallas, Tex.; Herbert P. Lindahl, Bellevue, and Elling Tjonneland, Kent, both of Wash., assignors to The United States of America as represented by the Administrator of the Federal Aviation Administration

Filed June 15, 1970, Ser. No. 46,082
Int. Cl. F02k *11/00*; F15c *1/08*
U.S. Cl. 137—15.2 8 Claims



A fluid flow stabilizing and terminal or normal shock wave stability control system, utilizing fluidic vortex throttling valves can be integrated with the intake of a jet propulsion power plant, to attenuate gust disturbances and the intake's terminal or normal shock wave movement, thereby preventing unstart or undesirable terminal shock wave expulsion from the intake during transonic or supersonic mode. Further, the vortex valve terminal shock stability system can be used for preventing unchoking of the intake during a noise abatement mode of operation, wherein the shock wave is positioned within the intake forward of the engine section to prevent the engine compressor noise from passing out through the cowl entrance. The vortex valve shock stability system can also stabilize buzz for mixed, internal, or external compression intakes.

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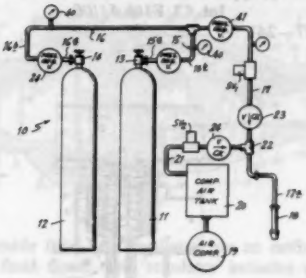
3,643,677

## COMPRESSED GAS SUPPLY SYSTEM

Manny Begleiter, Bronx, N.Y., assignor to Miner Industries, Inc., New York, N.Y.

Filed Apr. 29, 1970, Ser. No. 32,786
Int. Cl. G05d *16/06*
U.S. Cl. 137—113 5 Claims

In a compressed gas supply system, particularly for supplying helium under pressure to inflate balloons, as in balloon vending machines, two tanks containing gas under pressure are connected to a supply line through respective pressure regulating valves set to feed gas under relatively low pressures from the respective tanks to the supply line, and the regulating valve associated with one of the tanks is set to feed at a pressure slightly higher than that at which the other regulating valve is set to feed so that gas is initially supplied from the tank whose regulating valve is set at the slightly



higher pressure and feeding of gas from the other tank commences automatically only when the pressure of gas in the first tank has been reduced substantially to the pressure setting of the regulating valve for that other tank.

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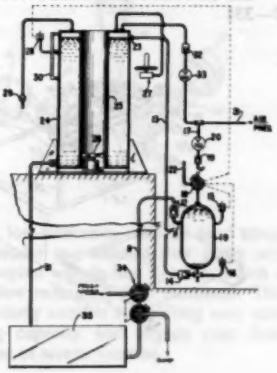
3,643,678

## SELF-CONTAINED PUMPLESS COOLING WATER SYSTEM

Kurt Genrich, Oak Park, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed May 27, 1970, Ser. No. 40,777
Int. Cl. F04f *1/06*
U.S. Cl. 137—209 1 Claim



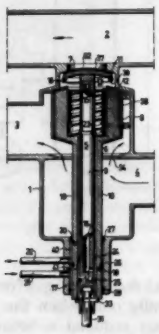
A water storage tank maintained under constant air pressure is supplied with water from a filler tank which can be connected to a source of air pressure or to the atmosphere through a three-way valve. The valve is actuated in response to the level of water in the filler tank to transfer water to the storage tank when the filler tank is full and permits the replenishment of water in the filler tank when a low level is reached.

3,643,679

**EQUIPMENT DESIGNED TO REGULATE THE FLOW OF, PREFERABLY, A STERILE LIQUID AND A DISHWASHING LIQUID OR A STERILIZING AGENT**

Jan Ingvar Hansson, Lomma, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed May 26, 1970, Ser. No. 40,540
Claims priority, application Sweden, June 26, 1969, 9059/69
Int. Cl. F16k 51/00
U.S. Cl. 137—241 17 Claims



A valve structure for controlling the flow of a liquid in a pipe for filling packages and for controlling the flow of a liquid for cleaning the pipe whereby suitable separation is obtained and vapor seals are employed.

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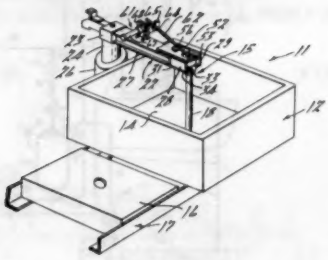
3,643,680

**BOTTOM POUR STOPPER**

Robert T. Hall, Orchard Lake, and Donald L. Justen, Ann Arbor, both of Mich., assignors to Kelsey-Hayes Company

Filed Sept. 14, 1970, Ser. No. 71,756
Int. Cl. F16k 29/00; B22d 37/00
U.S. Cl. 137—331 11 Claims



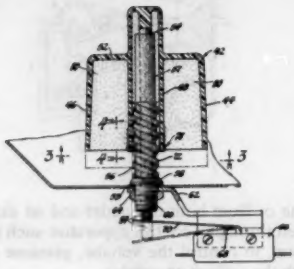
A stopper arrangement for controlling the flow of molten metal or the like through the bottom opening of a ladle. The stopper arrangement is supported for movement about a longitudinal axis between its opened and its closed positions. The supporting arrangement for the stopper element is such that the element may shift transversely with respect to the longitudinal axis but will always move in a direction parallel to the longitudinal axis as it is opened or closed. The stopper element is also supported for oscillation and is positively rotated when in its closed position for insuring good sealing engagement with the opening.

3,643,681

**TURBULENCE-DAMPENED FLOAT CONTROL**

Edward C. Simmons, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1970, Ser. No. 89,824
Int. Cl. G05d 9/12
U.S. Cl. 137—429 4 Claims



A standpipe extending upward from the bottom of a liquid container is provided with external helical square threads. A float fits over the standpipe and has a standpipe-operating rod extending down through the standpipe to a control switch below the container. The switch controls a valve for filling the container with liquid to a predetermined liquid level. The float is provided with a sheet metal nut having inwardly projecting teeth engaging the helical threads for rotating the float as the changing liquid level raises and lowers the float relative to the standpipe.

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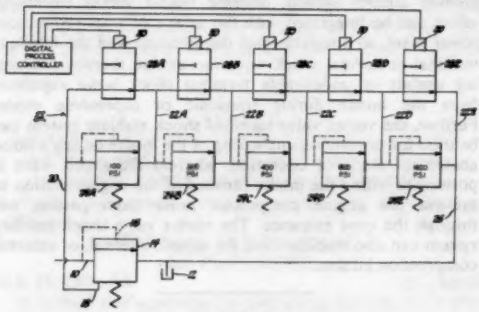
3,643,682

**POWER TRANSMISSION**

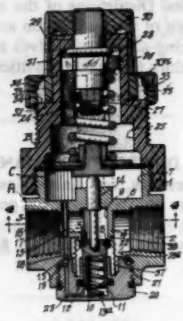
Bernard J. Chmura, Clawson, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 26, 1970, Ser. No. 84,014
Int. Cl. F16k 31/12, 17/38
U.S. Cl. 137—489 4 Claims



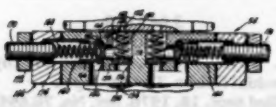

A fluid pressure control system includes a pilot-operated main relief valve having a vent connection by which its relieving pressure is controlled. A series of pilot relief valves with individual bypassing valves are connected in a ladder network to the vent. Their individual pressure settings vary in binary increments and may be controlled by a digital process controller to select any one of a number of discreet pressure settings equal to two raised to a power represented by the number of pilot relief valves.

3,643,683
## DOUBLE VENTURI PRESSURE REGULATOR
Albert L. Semon, 11 Eliot Pl., Short Hills, N.J.
Filed Sept. 23, 1970, Ser. No. 74,746
Int. Cl. F16k *17/34*
U.S. Cl. 137—484.8 5 Claims



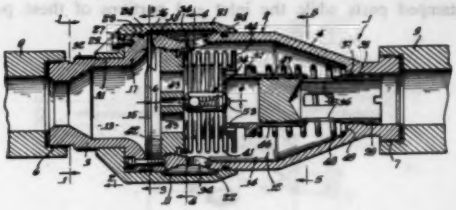
A fluid pressure regulator casing has a piston valve in a cylinder coactive with an adjustable spring-pressed diaphragm to control flow of fluid from an inlet passage through an outlet duct across which extends a venturi tube for subjecting both said diaphragm and said piston valve to the pressure produced by fluid flow through said outlet duct past the venturi tube, so that the regulator may be small and may have greater capacity or outlet flow and less pressure drop in relation to prior regulators. A locking ring coaxially rotatable on a resilient flange on the casing coacts with said flange to lock and release an adjusting knob for the regulation of the spring pressure on the diaphragm with a minimum of possibility of unintentional rotation of the knob from its adjusted position.

3,643,684
## PRESSURE CONTROL DEVICES FOR PNEUMATIC CIRCUITS
William L. Moore, 560 S. Ann Arbor St., Saline, Mich.
Filed Mar. 16, 1970, Ser. No. 19,899
Int. Cl. F16k *17/18*
U.S. Cl. 137—493.7 11 Claims



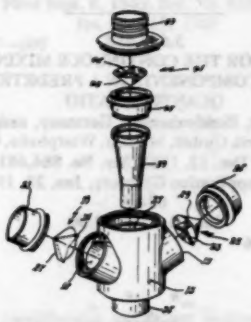
Pressure-reducing devices for use in pneumatic systems which include apparatus, such as air cylinders and the like, that are operated from a source of air under pressure. The devices are adjustable so that a common source of high-pressure air can be used in connection with different apparatus operable at different reduced pressures, and the devices will permit optimum selection of air pressures for each such apparatus. In one form, the device is a platelike structure that can be sandwiched in between a conventional solenoid operated air valve and a subplate manifold therefor. Other forms of devices are disclosed for use in other locations in pneumatic systems.

3,643,685
## FLOW REGULATOR
Russell Duane Hays, Broadview, Ill., assignor to Schaub Engineering Co., Downers Grove, Ill.
Filed Nov. 4, 1970, Ser. No. 86,901
Int. Cl. G05d *7/01*
U.S. Cl. 137—501 10 Claims



An adjustable fluid flow regulator has an orifice through which the fluid flows. The regulator includes end-to-end housing sections which have precision facing surfaces that define the orifice. The effectively used part of the orifice is preset by a manifold rotatable on the housing. A spring-loaded sensing device comprising a bellows which operates a metering valve maintains a constant pressure differential across the orifice despite variations in upstream and downstream pressures.

3,643,686
## HIGH-VELOCITY BREATHING VALVE
Ewald Koegel, 946 E. Sunshine Drive, San Antonio, Tex.
Filed Oct. 21, 1970, Ser. No. 82,656
Int. Cl. F16k *15/14*
U.S. Cl. 137—512 5 Claims

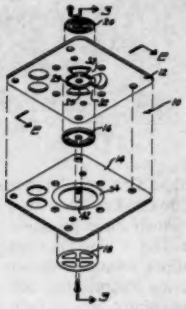


A high-flow, low-resistance minimal dead space breathing valve having intake and exhaust flow paths separated but coaxial and coupled with in-line K-valves which reduce turbulence and flow resistance to a minimum. The breathing valve is particularly suitable for making very accurate maximal breathing capacity and oxygen cost determinations under conditions of severe exercise.

3,643,687
## COMPRESSOR VALVE ASSEMBLY AND METHOD OF PRODUCING THE SAME
Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Toledo, Ohio
Filed Nov. 25, 1969, Ser. No. 879,863
Int. Cl. F16k *15/14*
U.S. Cl. 137—512 15 Claims

A laminated valve plate assembly for a reciprocable piston compressor said plate being of the type formed substantially

by stamping processes and characterized by being only two laminations thick and having at least some of the port-defining surfaces which are smooth and have compound curvatures that are inclined with respect to the plane of the plate to provide a less turbulent flow through the ports and to reduce the required thickness of the finished valve plate. The outlet end portions of both the intake and exhaust means comprise continuous slots formed by stamping processes and stamped parts while the inlet end portions of these port



means comprise a plurality of discontinuous slots. Peripheral recesses are formed around the top and bottom surfaces of the plate by shearingly depressing the edges thereof to eliminate burrs and to protect the edges of the lapped top and bottom surfaces from damage due to rough handling prior to the installation of the valve assembly between the cylinder head and cylinder block of the compressor. The disclosure also includes novel methods for forming the above-mentioned structures.

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**3,643,688**

**DEVICE FOR THE CONTINUOUS MIXING OF BEVERAGE COMPONENTS IN A PREDETERMINED QUANTITY RATIO**

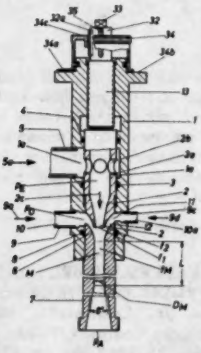
**Hartmut Meinert, Haddenhausen, Germany, assignor to Noll Maschinenfabrik GmbH, Minden, Westphalia, Germany**

**Filed Dec. 12, 1969, Ser. No. 884,681**

**Claims priority, application Germany, Jan. 28, 1969, P 19 04 014.3**

**Int. Cl. F16k** *19/00*

**U.S. Cl. 137—556** **15 Claims**



A device for the continuous combination and mixing of a plurality of liquid beverage components in an accurately maintained adjustable quantity ratio, where a jet mixer has a central pressure nozzle as part of an axially adjustable hollow plunger through which the pressurized liquid, water in the case of soft drinks, passes into a receiving nozzle past the infinitely variable annular opening of a suction chamber through which one or more admixed components are drawn into the receiving nozzle. The adjustment of the annular opening for the suction chamber determines the overall mixing ratio to water, while the flow volume of the various admixed components is controlled by separate throttle valves in their supply conduits. Distortions of the mixing ratio during startup and shutdown of the installation are minimized by accurately synchronizing all shutoff valves and by keeping the liquid volumes within the mixer cavities within predetermined ratios.

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**3,643,689**

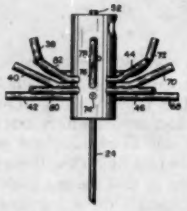
**FLUID DISTRIBUTION MANIFOLD**

**Jack Isreeli, Mamaroneck, and Aaron Kassel, Brooklyn, both of N.Y., assignors to Technicon Corporation, Tarrytown, N.Y.**

**Filed Oct. 31, 1969, Ser. No. 872,816**

**Int. Cl. B01d** *15/08*

**U.S. Cl. 137—561** **7 Claims**



A fluid distribution manifold for the division of a segmented fluid stream into a plurality of similarly configured segmented fluid streams is provided and comprises a manifold body forming a manifold chamber, a fluid stream inlet, and a plurality of fluid stream distribution outlets to flow the similarly configured fluid streams from the distribution chamber. The volume of said manifold chamber is no greater, and preferably substantially less, than the volume of the smallest of said fluid stream segments to thus insure substantial manifold chamber washout to prevent contamination of a succeeding fluid stream segment by the residue of a preceding fluid stream segment, and provide for accurate division of said segmented fluid stream into said plurality of similarly configured segmented fluid streams.

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**3,643,690**

**VENTED FUEL TANK**

**Hiroshi Sarai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Sept. 10, 1970, Ser. No. 70,695**

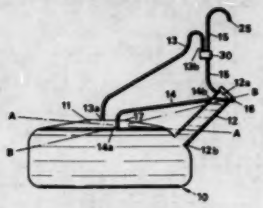
**Claims priority, application Japan, Sept. 13, 1969, 44/87497**

**Int. Cl. F16k** *45/00*

**U.S. Cl. 137—587** **4 Claims**

A fuel tank comprising a fuel tank body, a first vent pipe, one end of which extends for a desired length into the tank body from an upper faceplate while its other end is in communication with the upper part of a fuel filling pipe which is connected at its lower end to the fuel tank body. For forming an air chamber having a desired capacity in the upper part of the tank body, the lower end of the fuel filling pipe opens into the inside of fuel tank body at a position below the lower opened end of the first vent pipe, a second vent pipe is provided with its lower end opening into the upper part of the fuel filling pipe and with its upper end opening into the atmosphere, and a third vent pipe communicating between the

second vent pipe and the air chamber in the fuel tank body through a check valve. By means of the check valve the third



vent pipe is opened into the atmosphere through the second vent pipe only when the fuel overflows out of the fuel filling pipe.

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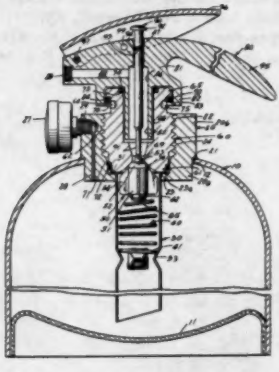
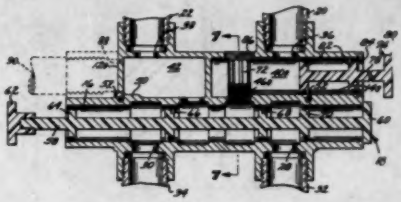
**3,643,691**
**VALVED HEAD ASSEMBLY FOR PRESSURIZED RECEPTACLES**
**Charles K. Huthsing, Jr., Old School Road, Libertyville, Ill.**
**Filed Feb. 3, 1969, Ser. No. 796,091**
**Int. Cl. F16k *31/44***
**U.S. Cl. 137—590** **12 Claims**



A fire extinguisher head assembly includes a core, a syphon tube seated in said core, a spring biasing a valve construction upwardly into engagement with a valve seat on a retaining bushing that is screwed into the core to clamp the syphon tube in place. An independent handle and valve-operating assembly may be attached to said retaining bushing with a quick-release coupling. Said operating assembly includes a body portion having a collar that fits about a retaining bushing, a handle means, an actuator pin connected therewith, a discharge rod extending through a vertical passage from the valve construction to a pivoted operating lever means whereby upon depression of the rod by the operating lever the valve is unseated and allows discharge of the receptacle contents through the vertical passageway and intersecting generally horizontal passageway. An alternate operating means includes a cam pivotable by a sliding trigger to depress the actuator pin.

**3,643,692**
**VALVE**
**Paul L. Traylor, 2506 Lighthouse Lane, Corona Del Mar, Calif.**
**Filed Sept. 28, 1970, Ser. No. 76,076**
**Int. Cl. F16k *43/00***
**U.S. Cl. 137—599.1** **10 Claims**



A valve for controlling fluid flow and particularly useful as a bypass valve for water treatment equipment. The valve is characterized by a casing provided with parallel main and auxiliary bores intersected by a plurality of passages and reciprocably accommodating a valve member for movement in the main bore between bypass and water treatment positions. The axes of the bores and passages lie in the same plane to facilitate water flow and simplify installation, and the auxiliary and main bores are preferably cylindrical and of approximately the same diameter so that the valve is thereby capable of flexibility in mounting auxiliary elements such as strainers, shutoff valve members and the like.

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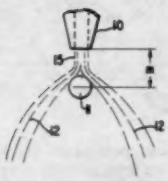
**3,643,693**
**MULTISTABLE WAKE DEFLECTION AMPLIFIER**
**Raymond N. Auger, 456 Riverside Drive, New York, N.Y.**
**Filed Sept. 8, 1969, Ser. No. 855,945**
**Int. Cl. F15c *3/00***
**U.S. Cl. 137—608** **9 Claims**



A fluidic amplifier for use in the performance of logical functions in digital systems utilizing a cylindrical or other shape obstruction in a power stream to produce a deflectable wake when the stream is a jet of approximately the same size as the deflecting shape.

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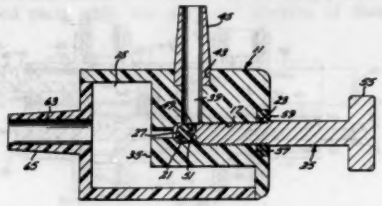
**3,643,694**
**AQUARIUM GANG VALVE**
**Bernard Duke, Deal, N.J., and David Z. Levensohn, New York, N.Y., assignors to Miracle Pet Products, Inc., Jersey City, N.J.**
**Filed Nov. 10, 1969, Ser. No. 875,040**
**Int. Cl. F17d *1/00***
**U.S. Cl. 137—608** **1 Claim**

An aquarium gang valve including a manifold formed with an inlet chamber and a plurality of through stem-receiving bores leading therefrom. The bores are formed along their inner portions with reduced-in-diameter valve seats and on their outer extremities with internally threaded sections. The manifold includes outlet ports which are in communication with the respective bores. A plurality of elongated valve

stems are inserted in the respective bores and are formed on their axially outer lengths with externally threaded portions for engagement with the internally threaded bore portions. The valve stems include resilient poppets on their inner ends for engagement with the respective seats whereby the stems may be screwed inwardly in the respective bores to engage



the respective poppets with the respective seats to gradually deform the poppets and progressively decrease the airflow past the respective seats to thereby provide for relatively fine metering of air to the outlet ports. Frictional grommets may be disposed concentric with the axially outer ends of the stems for providing resistance to turning of the stems to maintain such stems at their desired settings.

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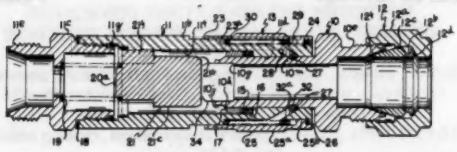
**3,643,695**

## FLUID LINE COUPLER

**Frank L. Strah, Richmond Hgts., and Edward J. Trepannier, Painesville, both of Ohio, assignors to Commercial Screw Products, Inc.**

**Filed Mar. 23, 1970, Ser. No. 21,728**
**Int. Cl. F16l *29/00***
**U.S. Cl. 137—614.04** **5 Claims**



A single hand manipulatable quick-connect-disconnect fluid line coupler with female body portion and a male connector portion attachable to respective line ends by integral fittings. The body is proportioned for manual grasping with two-finger manipulatability of a slidable actuating sleeve; and the body slot convergency and the disposition therein of parallel locking pins engageable with a male portion circumferential locking groove are so related and a simple seal structure provided so as to afford a firm sealed lock under high pressure while facilitating manual actuation in a low-cost structure. Single, double, and nonvalving couplers are shown.

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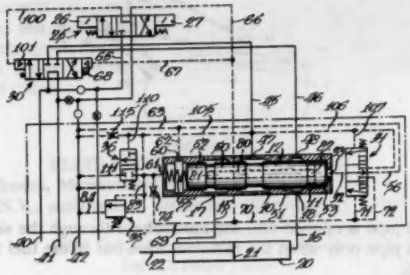
**3,643,696**

## HYDRAULIC CONTROL CIRCUIT

**Norman B. Christensen; Thomas A. Clark, and Robert J. Webers, all of Racine, Wis., assignors to Rex Chainbelt Inc.**

**Filed Sept. 2, 1970, Ser. No. 68,874**
**Int. Cl. F16k *11/07*; F15b *11/08***
**U.S. Cl. 137—625.6** **12 Claims**

A hydraulic control circuit having a control valve with a multiposition control spool having hydraulically set cutoff positions wherein the spool is hydraulically blocked against movement including a plurality of ports communicating with the control valve bore and suitable hydraulic control components for opening or closing lines connected to said ports. Further, a circuit for regenerative cylinder operation wherein the cylinder is positively blocked against movement in both directions when the control circuit is set for such condition and wherein the regenerative position of the control spool is hydraulically locked and a pressure relief valve is in circuit



whereby, when the cylinder pressure exceeds a predetermined amount, the relief valve opens to release the hydraulic locking of the control spool whereby the control spool can move to a position to discontinue the regenerative flow of fluid to the cylinder.

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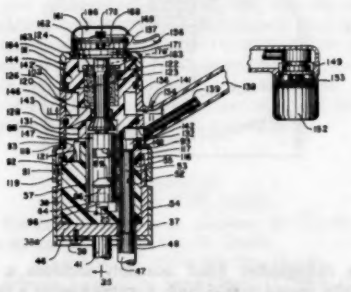
**3,643,697**

## MIXING VALVE STRUCTURE

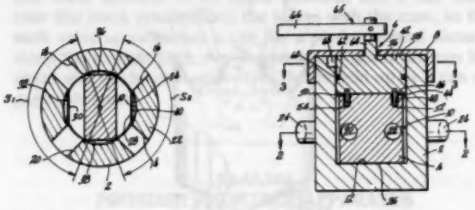
**Aaron A. Staat, 82 Dudley Road, and Robert A. Staat, 350 Marmil Circle, both of Fort Mitchell, Ky.**

**Continuation-in-part of application Ser. No. 614,098, Feb. 6, 1967, now abandoned. This application Feb. 10, 1969, Ser. No. 797,737**
**Int. Cl. F16k *19/00***
**U.S. Cl. 137—625.17** **23 Claims**



A valve including an outer casing having a pair of inlets, an outlet and a cup-shaped recess formed therein. A valve chamber cartridge is removably received in the recess, the cartridge including a body having a pair of end surfaces and a valve chamber formed in the body extending from one of the end surfaces. A pair of inlet passages are formed in the body of each of which has one end communicating with the valve chamber and its other end communicating with an exterior surface of the cartridge body. Ports in the casing connect each of the inlet passages with one of the pair of inlets, and a slide valve member is received in the valve chamber for controlling communication between the pair of inlets and the outlet through the inlet passages.

3,643,698
VALVE
Lester E. Smith, Herrin, Ill., assignor to Olin Corporation
Original application Dec. 5, 1968, Ser. No. 781,494, now Patent No. 3,535,874, dated Oct. 27, 1970. Divided and this application Feb. 5, 1970, Ser. No. 13,226
Int. Cl. F16k 11/02
U.S. Cl. 137—625.23 6 Claims



A valve including a body having four ports having coplanar axes. A floatable rotor, having a flow channel therethrough, is mounted in said body and is rotatable to a position where each opening of the flow channel is in communication with an adjacent port.

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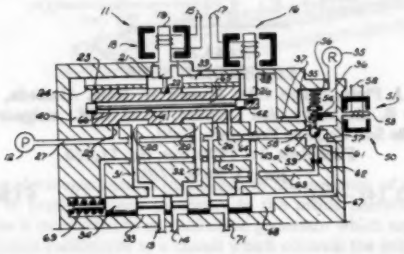
3,643,699
TORQUE MOTOR OPERATED VALVE
Richard K. Mason, Granada Hills, Calif., assignor to Textron, Inc.
Filed May 18, 1970, Ser. No. 37,985
Int. Cl. G05d 16/20
U.S. Cl. 137—625.64 8 Claims



A valve slidably disposed within a bore and movable between first and second positions to control application of a source of fluid under pressure between an inlet and outlet port. An electrically operated torque motor is connected to the valve to drive the valve in response to an electrical signal applied to the torque motor. The valve is connected to a system and is responsive to a discrepancy between a control and monitor section of the system to effectively lock the system in a failure indicating mode of operation.

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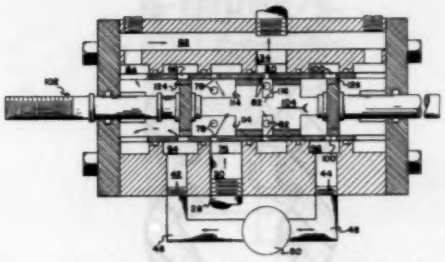
3,643,700
VALVE
Delbert L. Black, Route 1, Box 92, Wellington, Colo.
Filed Aug. 24, 1970, Ser. No. 66,360
Int. Cl. F16k 11/07
U.S. Cl. 137—625.68 4 Claims

A hydraulic system for independently controlling a plurality of individual reversible variable speed hydraulic motors from a common pressure supply source. A plurality of control valves, one for each motor to be controlled, are connected in a closed series circuit with a pump which is operable to recirculate fluid under pressure through the circuit. Each valve, when located in a centered or neutral position, permits all fluid entering the valve inlet to pass directly to the valve outlet. Upon displacement from the neutral position, a portion of the flow into the valve inlet is diverted to the associated motor, passes through the motor and is returned to the valve to rejoin the nondiverted portion of the flow. The magnitude and direction of flow through the motor is dependent upon the magnitude and direction of displacement of the valve from its neutral position. Displacement of a valve in either direction beyond a selected maximum displacement blocks the inlet port of the valve and the resultant increase of pressure at the pump triggers a pressure responsive switch to shut down the pump.



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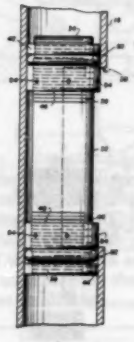
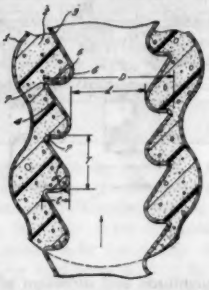
3,643,701
EMERGENCY MONOWALL TUBE REPAIR KIT
Michael Wadiak, Westfield, and George T. Higham, Parsippany, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.
Filed Sept. 14, 1970, Ser. No. 71,955
Int. Cl. F16l 55/16
U.S. Cl. 138—97 2 Claims



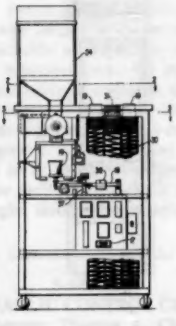
A quick temporary repair for a ruptured tube which is one of a number of parallel tubes making up a boiler furnace wall. The rupture is enlarged to form an opening large enough to accept a pipe having at each end a gasket, which may be compressed axially and consequently to expand radially to engage the sidewalls of the tube so that the water or steam will pass through the pipe rather than pass out of the rupture.

3,643,702
FLEXIBLE PIPE SYSTEM
Knut Kauder, Hannover, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany
Filed Oct. 16, 1969, Ser. No. 866,843
Int. Cl. F16l 11/12
U.S. Cl. 138—121 7 Claims



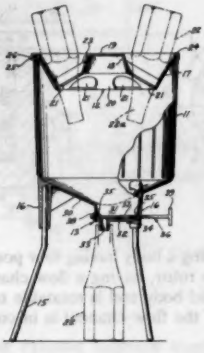
A pipe system is disclosed which includes a corrugated pipe for conduction of fluid, the corrugation defining an asymmetrical wave pattern in an axial plane, to establish a periodically recurring sequence of flow zones of gradually increasing cross section, alternating with nozzles.

3,643,703
METHOD AND APPARATUS FOR MILLING PEANUT BUTTER
Saul R. Rosenberg, 2220 Bagley Ave., Los Angeles, Calif.
Filed July 31, 1970, Ser. No. 59,947
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—1 4 Claims



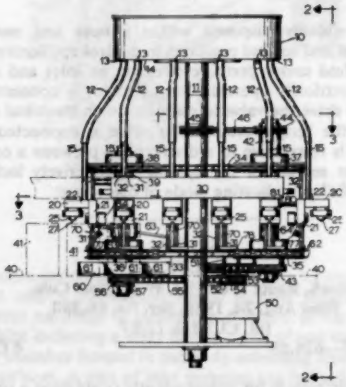
An automatic vending machine for producing fresh peanut butter from deshelled peanuts is provided which upon insertion of a coin enables the user to open a door, insert a cup, close the door and thereby cause automatic feeding of peanuts and milling of a predetermined amount of peanut butter which, when delivered into the cup, shuts off the mill and allows the user to open the door and remove the cup.

3,643,704
DEVICE FOR COLLECTING AND SELECTIVELY DISPENSING A FLOWABLE SUBSTANCE
William G. Carr, Brooklyn, N.Y., assignor to Stamco, Inc., Levittown, N.Y.
Filed Feb. 26, 1970, Ser. No. 14,410
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—106 5 Claims



A device for draining a flowable substance such as ketchup in partly filled bottles into a receptacle and filling a bottle with ketchup collected in the receptacle includes a receptacle open at its top and including a holder for holding one or more partly filled bottles in draining position. A discharge valve in the bottom of the receptacle serves to fill a bottle placed underneath the receptacle by temporarily opening the valve.

3,643,705
LIQUID DISPENSER
Peter J. Pinto, Union City; Donald M. King, Alameda, and Roy B. McCarthy, San Leandro, all of Calif., assignors to Leslie Salt Co., San Francisco, Calif.
Filed Sept. 14, 1970, Ser. No. 71,660
Int. Cl. B65b 57/06
U.S. Cl. 141—141 6 Claims



A device for dispensing liquid into cans moving along a straight path. A rotating reservoir holds liquid at a desired head pressure, and has spaced peripheral bottom outlets. A pair of chains is joined together by a series of vertical rods and driven by sprockets along a horizontal path, part of

which parallels the can path, the chains and reservoir being driven in synchronization. Valve carriages are slidable up and down, each on a pair of the rods, and each carriage supports a valve housing that is connected by a conduit to a reservoir outlet. A valve closure member in each housing has a ferromagnetic upper portion. Each carriage has a lever which holds the carriage up to a desired height only when in contact with a can. A cam track is engaged by a follower for each carriage for elevating the carriage and valve from a normal lower position to an upper position, and a star wheel near this track synchronizes the valves with the cans, so that each valve accompanies a can for a predetermined distance along the straight path. An electromagnet above the can line opens and holds open each valve that is held up by a can engaging its lever.

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**3,643,706**

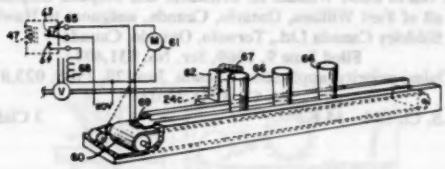
**PROXIMITY CONTROL APPARATUS**

**Edwin E. Ritchie, Bainbridge Island, Wash., assignor to Wyott Corporation**

**Original application Aug. 18, 1969, Ser. No. 850,967, now Patent No. 3,601,621. Divided and this application Apr. 30, 1971, Ser. No. 138,982**

**Int. Cl. B65b** *57/02*

**U.S. Cl. 141—160** **2 Claims**



An electronic control responsive to the presence of an object in predetermined proximity to the probe thereof. The probe is connected to an oscillation generator which supplies electrical oscillations to a circuit which controls the initiation of the timing cycle of a timing device when an object is brought into proximity of the probe and electrical oscillations supplied by the generator are interrupted. The timing device supplies a signal to a control circuit after a predetermined timed interval to shut off the load circuit which was activated when the timing cycle was started.

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**3,643,707**

**STATIC-REDUCING AND VAPOR-REDUCING LOADING VALVE WITH LOW-PRESSURE DROP**

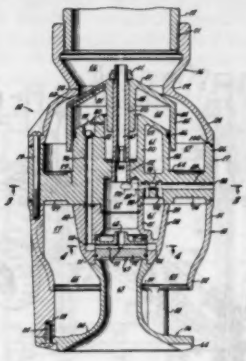
**Harold W. Ensign, Fullerton, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.**

**Continuation-in-part of application Ser. No. 799,567, Feb. 17, 1969. This application Sept. 8, 1970, Ser. No. 70,247**

**Int. Cl. B65b** *1/04, 3/04*

**U.S. Cl. 141—286** **25 Claims**

A valve for use in loading the tanks of tank trucks with gasoline or other dangerous liquid. The valve incorporates an automatic flow restrictor for greatly restricting flow when the tank is substantially empty, thus minimizing generation of vapors and static electricity, but for permitting rapid flow when the valve outlet into the tank is submerged. An internal shoulder, of small size and located close to the top of the valve, is provided to greatly reduce the flow velocity of the liquid when the tank is substantially empty. Such shoulder permits high-volume rapid flow to occur with minimized



pressure drop. An external deflector causes the liquid to flow generally horizontally when entering the tank.

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**3,643,708**

**DELIMBING ARRANGEMENT**

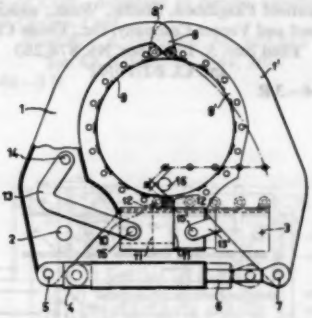
**Karl Thore Lindblom, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden**

**Filed Jan. 20, 1970, Ser. No. 4,277**

**Claims priority, application Sweden, Jan. 31, 1969, 1303/69**

**Int. Cl. A01g** *23/02*

**U.S. Cl. 144—2 Z** **3 Claims**



The delimbing apparatus of the present invention is an improvement over the conventional chain link type of delimber, the improvement being characterized in that the cutting circumference of the chain link device of the apparatus acts in the axial direction of the link pivots and is offset successively in said direction for consecutively shearing off limbs projecting from the same tree trunk level.

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**3,643,709**

**ROUNDWOOD STUMP PROCESSOR**

**Bruce J. McColl, Whitby, Ontario, Canada, assignor to Owens-Illinois, Inc.**

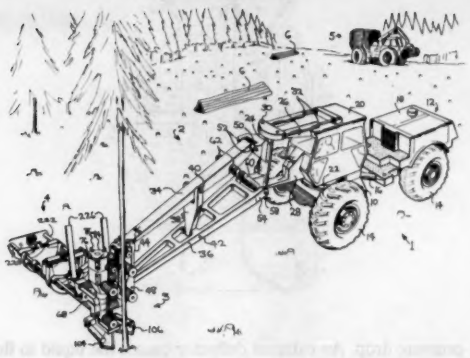
**Filed Feb. 12, 1970, Ser. No. 10,976**

**Int. Cl. A01g** *23/02*

**U.S. Cl. 144—3 D** **10 Claims**

Apparatus for severing and processing trees into sectioned pulpwood bolts includes an extendable head-reach mechanism pivotally supported on a mobile vehicle for arcuate horizontal movement and vertical elevational movement

about and with respect to the machine. The head-reach mechanism supports at its outer end (a) a processing unit in-



cluding tree grasping shearing debranching means and feed mechanism and (b) a storage magazine for pulpwood and unloading means.

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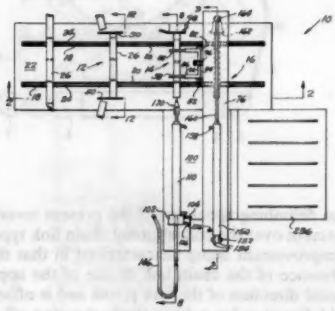
**3,643,710**

**METHOD AND MACHINE FOR MAKING BAMBOO VENEER AND PRODUCTS THEREOF**

**Chester Manfield Fitzgibbon, Seattle, Wash., assignor to Belize Plywood and Veneer Company, Inc., Union City, N.J.**

**Filed Nov. 5, 1969, Ser. No. 874,283**
**Int. Cl. B27f *5/02***
**U.S. Cl. 144—3 R** **7 Claims**



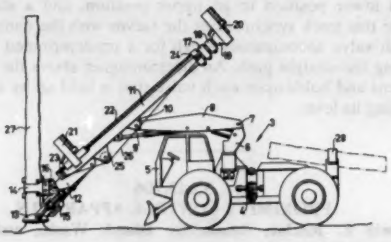
A method of making bamboo veneer including subjecting a debarked green bamboo trunk to softening by moisture and heat, cutting the trunk to a desired length, decoring the trunk by forcing a plunger longitudinally therethrough, straightening the decored and softened trunk by applying pressure internally and externally to the trunk, and simultaneously cutting a thin veneer from the trunk while rotating the trunk. The invention further contemplates a machine for performing the described method and bamboo products utilizing the formed veneer as, for example, bamboo plywood.

**3,643,711**

**TREE HARVESTING MACHINE**

**Erich Puna, Gavle, Sweden, assignor to Brundell Och Jonsson AB, Gavle, Sweden**

**Filed Nov. 26, 1969, Ser. No. 880,154**
**Claims priority, application Sweden, Dec. 16, 1968, 17203/68**
**Int. Cl. A01g *23/02***
**U.S. Cl. 144—2 Z** **5 Claims**



A tree harvesting machine comprising a vehicle carrying a crane. Clamping and cutting means are mounted on a common holder pivotally connected to the outer end of the fore crane arm which can be extended backwards to form a mast, and delimbing means are mounted at the top of the rearmost mast unit.

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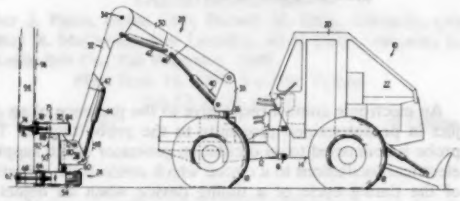
**3,643,712**

**TREE-SHEARING HEAD**

**R. Garth Doel; William H. Bricknell, and Stephen Osipenko, all of Fort William, Ontario, Canada, assignors to Hawker Siddeley Canada Ltd., Toronto, Ontario, Canada**

**Filed June 9, 1969, Ser. No. 831,491**
**Claims priority, application Canada, June 28, 1968, 023,815**
**Int. Cl. A01g *23/02***
**U.S. Cl. 144—34 E** **3 Claims**



A tree-shearing head for use at the end of a boom attached to a logging vehicle has a shear with an associated tree retaining means which retains the butt of the sheared portion of the tree after cutting. A tree grasping means is spaced above the shearing means, and is pivotable with respect thereto, so that the tree can tilt during the shearing and while being grasped, thereby reducing binding of the shearing means.

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**3,643,713**

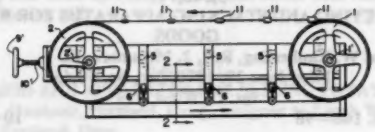
**MACHINE TO MANUFACTURE CLOSING FOLDING ELEMENTS AND THE DOORS AND SHUTTERS MANUFACTURED WITH THE SAME**

**Manlio Massetani, Bahia Blanca 2657-63, Buenos Aires, Argentina**

**Filed Sept. 20, 1969, Ser. No. 861,266**
Claims priority, application Argentina, Jan. 7, 1969, 218964; June 26, 1969, 222452
**Int. Cl. B27f *1/00***
**U.S. Cl. 144—86** **1 Claim**

A machine for producing an internal cavity or slot in a workpiece, and articles manufactured therewith. The

machine includes two wheels rotatably mounted on a frame, and a motor for rotating one of the wheels. Disposed around the wheels is an endless tape having a segment provided with cutting teeth. The cutting teeth consist of notches along one



tape edge and a tooth element transverse to the tape and located at one of the vertices of the notch. The tooth elements have different dimensions and are arranged progressively from smallest to largest.

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**3,643,714**

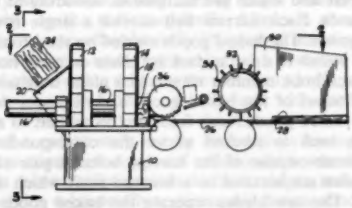
**PULP CHIP FORMING APPARATUS**

**Victor I. Utterback, 4583 Sunnyview Road, N.E., Salem, Oreg.**

**Continuation of application Ser. No. 678,836, Oct. 30, 1967, now abandoned. This application Dec. 29, 1969, Ser. No. 888,995**

**Int. Cl. B27b** *27/08*

**U.S. Cl. 144—176** **2 Claims**



A pair of chipping wheels mounted on a common drive shaft have blades on their outer, plane working surfaces, the blades on one wheel being for chipping veneer material and the blades on the other wheel being for chipping core material. The blades extend across a major proportion of the radii of the wheels, and feed means are arranged to feed veneer and core material to the associated wheels across substantially the full radial length of the blades. The veneer material is fed to its wheel substantially perpendicular thereto and the core material is fed to its wheel at an acute included angle thereto.

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**3,643,715**

**LOG POSITIONING APPARATUS**

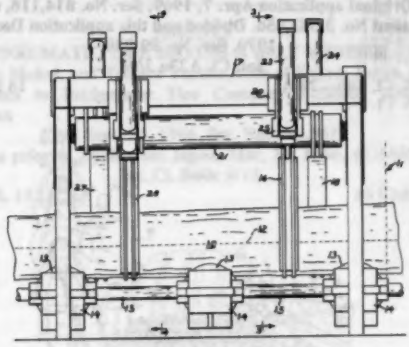
**Leonard L. Hayes, and Gerald J. Hottinger, both of Lewiston, Idaho, assignors to Potlatch Forests, Inc., Lewiston, Idaho**

**Filed Sept. 28, 1970, Ser. No. 75,934**

**Int. Cl. B27l** *5/00*

**U.S. Cl. 144—209 A** **4 Claims**

A positioning apparatus for aligning wood logs along a chosen axis in preparation for sawing or other processing in a plane perpendicular to the longitudinal log axis. A pair of transversely spaced grapples are used, each gripping the log securely. One set transversely centers the log with a minimal amount of lifting. The second set also transversely centers the log, and in addition locates the elevation of the log axis along a desired plane regardless of the amount or degree of taper in the log. The first set of grapples uses separate fixed pivotal axes, the second set uses a single grapple axis which is



elevationally varied as a function of the degree of closing of the first set.

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**3,643,716**

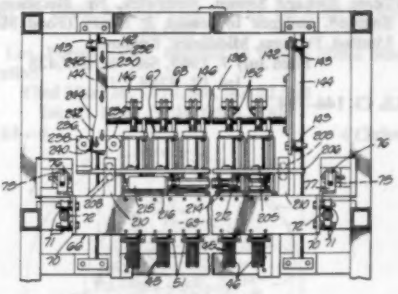
**MEANS FOR SECTIONIZING CITRUS FRUIT**

**Ronald C. Bushman, Pomona; Donn J. Rickard, Glendora, both of Calif.; John D. Webb, Winter Haven, Fla.; L. Bruce Alexander, San Marino, and Cleveland B. Church, Whittier, both of Calif., assignors to Brown International Corporation, Covina, Calif.**

**Filed Nov. 4, 1969, Ser. No. 873,850**

**Int. Cl. B26d** *1/28, 1/44, 3/00*

**U.S. Cl. 146—3 N** **29 Claims**



With a plurality of sectionizing tools partially inserted into a corresponding plurality of citrus fruit that are impaled on corresponding holders, each holder rotates until a radial membrane of the fruit thereon impinges on the corresponding sectionizing tool whereupon the sectionizing tool makes a sectionizing stroke. In the meantime, a new plurality of fruit is being loaded manually on corresponding loading spikes that are adapted to transfer the new plurality of fruit to the respective holders.

3,643,717

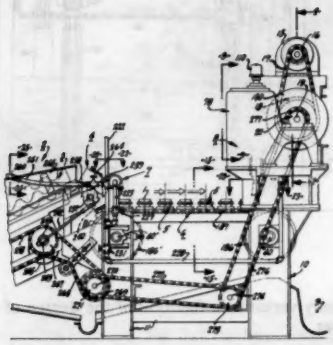
## APPARATUS FOR HANDLING, ORIENTING AND PITTING DRUPE HALVES

Konrad E. Meissner, Lafayette; Etheridge R. McClelland, Hayward, and George E. Kilner, Alameda, all of Calif., assignors to Filper Corporation, San Ramon, Calif.

Original application Apr. 7, 1969, Ser. No. 814,118, now Patent No. 3,583,456. Divided and this application Dec. 21, 1970, Ser. No. 99,928

Int. Cl. A23n *3/08*

U.S. Cl. 146—28 A 14 Claims



A pitter for removing pits from clingstone peaches and the like, in which conveyor and orienting means is provided for delivering a plurality of drupe halves having pits or pit halves therein to pit removing devices that operate in synchronism with the delivery of said halves thereto for removing said pits from said halves, and which orienting and conveyor means automatically adjusts the positions of the drupe halves for pitting and the conveyor means holds them for resisting rotation while applying a rotary force to the pits relative to said halves to remove said pits.

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3,643,718

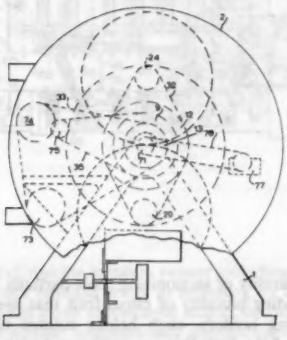
## FOOD-SLICING MACHINES

William Richard Swann, Rudgwick, Nr. Horsham, Sussex, England, assignor to Jessett & Henry (Food Machinery) Limited, Feltham, Middlesex, England

Filed July 7, 1969, Ser. No. 839,425

Int Cl. B26d *1/18*

U.S. Cl. 146—94 8 Claims



A solid food slicer for bacon and the like including a pair of circular blades journaled at the opposite ends of an elongated centrally pivoted rotor driven about a horizontal axis in a vertical plane. The blades are driven in a direction opposite to that of the rotor by a double pulley coaxial with but rotatable independently of the rotor drive shaft, a belt engaging one portion of the double pulley and both of a pair of drive pulleys attached to the respective rotatable cutting blades. The second belt engages the other portion of the double pulley to couple the same to a drive motor.

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3,643,719

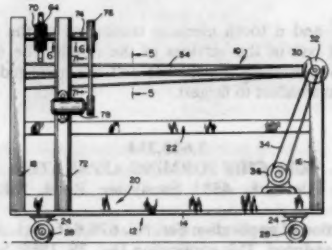
## CONVEYING AND STACKING APPARATUS FOR BAKED GOODS

Garland W. Kimberling, R.R. 2, Metamora, Ill.

Filed June 29, 1970, Ser. No. 50,433

Int. Cl. B26d *1/14*

U.S. Cl. 146—98 10 Claims



A portable wheeled frame is positioned between an oven and a packaging table in a bakery. The frame carries two motor-driven conveyor belt systems. One system includes a broad belt extending in a substantially horizontal plane and carrying two rows of aligned baked goods. The second system includes two narrow belts positioned alongside the broad belt and which are inclined downwardly at their terminal ends. Each narrow belt carries a single row of like baked goods. The baked goods carried on the broad belt actuate a switch to drive a stacking chain carrying hook members. Each hook member travels in a plane transverse to the path of travel of the baked goods and displaces two of the aligned baked goods items from the broad belt to a position wherein each is stacked above the corresponding baked goods items on one of the narrow belts. A pair of circular saw blades are secured to a forward shaft which drives the pulleys. The saw blades separate the baked goods items so that they are positioned on their appropriate belts.

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3,643,720

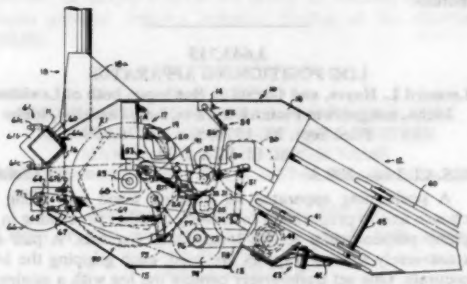
## FORAGE HARVESTER FEED ROLL DRIVE

Loren G. Sadler, Stevens, and Thomas W. Waldrop, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 26, 1970, Ser. No. 66,942

Int. Cl. A01d *57/00, 69/00*

U.S. Cl. 146—120 9 Claims



The drive for the floating and fixed feed rolls adjacent to the rotary cutter of a forage harvester comprises driven

sprockets on the respective rolls, an input sprocket on the input drive and a pivotally mounted spring-loaded idler sprocket. The floating roll sprocket and the idler sprocket are rotatably attached at opposite ends to an arm pivotally mounted intermediately between the centers of the idler and floating sprockets to provide adequate arc of contact on the floating and fixed sprockets and a taut chain with variations in the floating roll.

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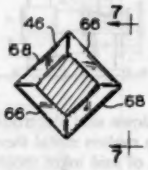
3,643,721

## METHOD AND APPARATUS FOR SLICING POTATOES

John E. Haubner, Portland, Oreg., assignor to Lamb Weston, Inc., Portland, Oreg.

Filed Aug. 5, 1970, Ser. No. 61,189
Int. Cl. B26d *4/22, 3/26*
U.S. Cl. 146—241 4 Claims




A rotary potato cutter has a stationary knife with an undulating cutting edge to obtain a corrugated surface on a potato slice. The outer surface of the knife is grooved along its full length to guide the slice therealong as the cut is made. Rotating crosscut knives adapted to cut the slice transversely into french fry size strips having cutting edges similar to the cutting edge on the stationary knife. Alternate ones of the crosscut knives are offset laterally in opposed directions from the stationary knife such that a ridge on a crosscut knife is 90° out of phase with a ridge on the stationary knife, adjacent crosscut knives being 180° out of phase with each other. Mounting the crosscut knives in this manner results in the surfaces of a potato strip cut by such knives having ridges and valleys therein in opposed relationship, whereby the finally cut potato strip appears to have ridges and valleys therein running substantially continuously therearound.

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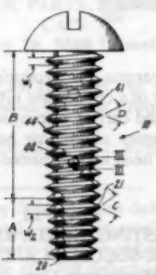
3,643,722

## SELF-LOCKING THREADED FASTENERS

Louis Oestereicher, Teaneck, N.J., assignor to Parker-Kalon Corporation, Clifton, N.J.

Filed May 16, 1969, Ser. No. 825,334
Int. Cl. F16b *39/30*
U.S. Cl. 151—22 12 Claims



A self-locking threaded fastener adapted for assembly with a member in which a standard internal thread is formed either by the fastener or a conventional tap. A thread is carried on the shank of the fastener having an included thread angle less than the standard included thread angle, a major diameter greater than is standard for the particular fastener size, and a root width less than is standard. At least one locking lobe is formed on the thread which lobe is engaged by material displaced by the thread whereby to effect locking.

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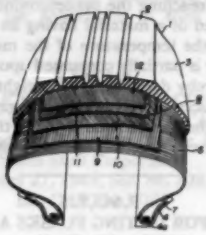
3,643,723

## PNEUMATIC TIRE HAVING A BELT MEMBER

Tsuneo Mukai, and Toshiro Tezuka, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 29, 1966, Ser. No. 582,961
Claims priority, application Japan, Mar. 11, 1966, 41/14601
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 10 Claims



A pneumatic tire having a carcass of at least one rubberized sheet including cord elements of flexible material, a tread portion mounted on but spaced from the carcass, and a breaker member mounted between the carcass and tread portion. The breaker member consists of at least two groups of sheets including parallel cord elements with different modulus of elasticity for each sheet. The groups each include at least a pair of sheets with the cord elements of the first group deviating from the equatorial direction of the tire by a first angle and the second group at a second angle larger than the first angle.

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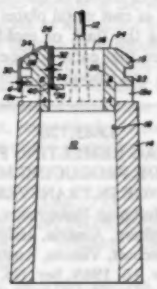
3,643,724

## METHOD OF INDICATING THE LEVEL OF A MOLTEN FLUID

Verne E. Lee, Portage, Ind., assignor to United States Steel Corporation

Filed Mar. 26, 1970, Ser. No. 22,968
Int. Cl. B22c *19/04*; G01f *23/06*
U.S. Cl. 164—4 4 Claims



A method of indicating a predetermined level of a molten fluid contained in an ingot-forming member for forming the molten fluid into an ingot when it cools is disclosed. The ingot-forming member has a molten fluid receiving end, an inner wall, an outer wall and a top wall bridging the inner

wall and the outer wall. The method includes the steps of: (a) providing a support member in loose fitting engagement with the ingot-forming member and having an outside support portion adjacent the outer wall, an inside support portion adjacent the inner wall and a bridging support portion adjacent the top wall for connecting the outside support portion and the inside support portion; and (b) mounting a float member on the free end of the inside support portion to extend inwardly from the inner wall at the predetermined level substantially parallel to the level of the fluid line of the molten fluid. The float member has a molten fluid contact volume so that the mean density of the sum of the weights of the support member and the float member per unit of volume of the contact volume is less than the mean density of the molten fluid and so that when the molten fluid engages the float member the support member moves away from the top wall of the ingot-forming member thereby giving a visual signal of the molten fluid reaching the predetermined level. The float member is formed of a material having an ignition temperature lower than the temperature of the molten fluid so that the float member is partially consumed upon contact with the molten fluid thereby decreasing the weight of the indicating device and produces downward flowing gases from the float member against the molten fluid to aid in the elevation of the float member thereby speeding up the visual signal.

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**3,643,725**

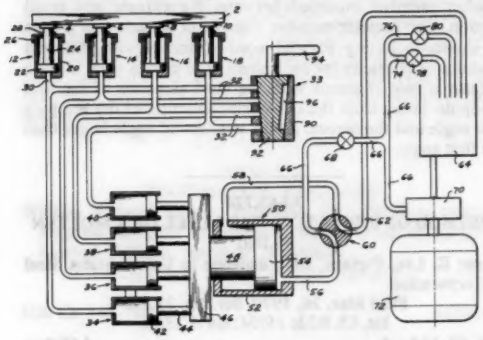
**METHOD FOR LIFTING FLASKS AND MOLDS**

**William L. Fismer, 162 Franklin St., Verona, N.J.**

**Filed May 15, 1969, Ser. No. 824,777**

**Int. Cl. B22c *17/06***

**U.S. Cl. 164—44** **4 Claims**



An arrangement is disclosed for improving the handling or stripping of the flasks or molds of the type which are used to cast large items such as cast metal plates or frames. A system is provided for lifting the flask or mold vertically from the pattern with assurance that each portion or part is moved at exactly the same rate and amount as every other part.

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**3,643,726**

**ELECTRIC SLAG REMELTING PROCESS AND APPARATUS FOR PRODUCING METAL INGOTS HAVING A CHANGE IN TRANSVERSE DIMENSION**

**Erwin Plockinger; Wolfgang Holzgruber, and Adolf Schneidhofer, all of Kapfenberg, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria**

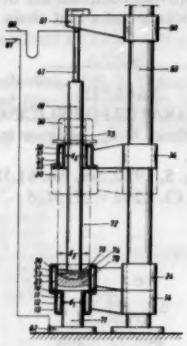
**Filed Nov. 10, 1969, Ser. No. 875,397**

**Claims priority, application Austria, Nov. 15, 1968, A 11116/68**

**Int. Cl. B22d *27/02***

**U.S. Cl. 164—52** **15 Claims**

A plurality of superimposed ingot molds are provided, which have open ends and differ in at least one inside transverse dimension. A slag layer is provided in said ingot molds. Electrode means which consist of a metal from which an ingot is to be formed are maintained dipped in said slag layer in each of said ingot molds for a period of time while electric current is passed through said electrode means to generate heat and thus fuse down said electrode means in each of said ingot molds to form molten metal therein. Said molten metal is solidified in each of said ingot molds, whereby an integral, rigid ingot is formed.



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**3,643,727**

**PROCESS AND APPARATUS FOR LINING CONDUCTIVE TUBES WITH INSULATING MATERIAL**

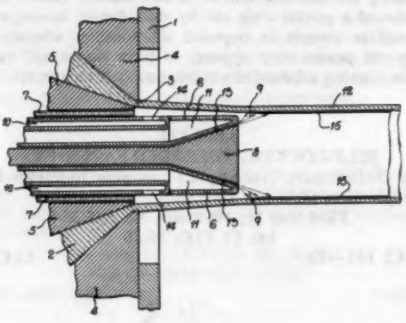
**Sergio Longoni, Milan, and Antonio Portinari, Sesto San Giovanni (Milan), both of Italy, assignors to Industrie Pirelli S.p.A.**

**Filed Mar. 11, 1970, Ser. No. 18,666**

**Claims priority, application Italy, Apr. 5, 1969, 15148 A/69**

**Int. Cl. B22d *11/12***

**U.S. Cl. 164—76** **13 Claims**



Process and apparatus for producing layer of insulating material on interior of a conductive tube in which the insulating material in a fluid carrier is sprayed interiorly of the tube by a spray and carrier evacuating head as the tube is extruded around said head and advanced.

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**3,643,728**

**PROCESS OF CASTING NICKEL BASE ALLOYS USING WATER-SOLUBLE CALCIA CORES**

**Charles O. Hulse, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed July 8, 1970, Ser. No. 53,291**

**Int. Cl. B22d *29/00***

**U.S. Cl. 164—132** **6 Claims**

A process for producing heat-resistant metal articles from nickel base or cobalt base superalloys having at least one

cavity therein comprising fabricating a ceramic core to the configuration of the cavity, the core consisting essentially of at least 50 percent calcia, the balance, if any, being a refractory ceramic material, the whole fired at a density range of 70 to 100 percent of theoretical density, supporting the core in a mold, casting the nickel alloy therearound and dissolving the core with hot water.

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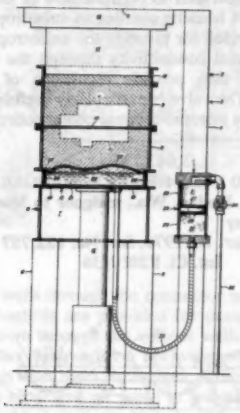
**3,643,729**

## SQUEEZE HEAD ASSEMBLY FOR MOLDING MACHINES

**Russell J. Smith, Toledo, and William H. Froman, Luckey, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Nov. 14, 1969, Ser. No. 876,882**
**Int. Cl. B22c *15/08***
**U.S. Cl. 164—170** **6 Claims**



A molding machine for making metal casting sand molds having for compacting the sand a squeeze head presenting to the sand a diaphragm backed by a liquid-filled pressure chamber open to the liquid side of an accumulator which adds liquid to the chamber for an initial compacting of the sand under low pressure and receives liquid therefrom during projection of the head in a final high-pressure compacting stage.

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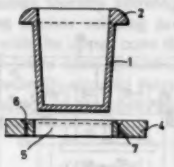
**3,643,730**

## APPARATUS FOR THE PRODUCTION OF SYNTHETIC PLASTICS MOLDS FOR METAL CASTING SMALL DENTAL PROSTHETIC PARTS, SUCH AS CROWNS AND CAPS

**Rudolf Scheu, Burgberg 20, 5868 Letmathe, Westfalia, Germany**

**Filed June 24, 1970, Ser. No. 49,458**
**Claims priority, application Germany, July 10, 1969, P 19 34 975.8**
**Int. Cl. A61c *13/08*; B22c *7/02*; B29c *1/02, 17/00***
**U.S. Cl. 164—235** **11 Claims**

In the production, by fluid pressure deformation of plastic foils, of molds for metal casting of small dental prosthetic parts, and in which a stump model is imbedded in a vessel attachable to a work plate of a foil deforming appliance, an insert, formed with a number of openings, is provided for attachment to the work plate. At least one pot-type vessel, having a supporting edge formed with fine air discharged channels, is inserted into an appropriate opening of the insert and a kneadable composition is placed in the vessel and shaped to extend somewhat conically above the support edge. The unprepared stump model is pressed into the composition and, after any necessary preparation of the stump model, fine channels are notched into the surface of the conically shaped portion of the composition to extend between the base of the



stump model and the fine air discharge channels. Thereafter, a plastics foil is deformed into conforming relation with the model either by the application of fluid pressure or by vacuum drawing.

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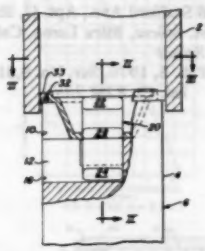
**3,643,731**

## DETACHABLE JOINT BETWEEN CONTINUOUS-CASTING STARTER BAR AND CASTING

**James T. Stull, Jackson Township, Butler County, Pa., assignor to United States Steel Corporation**

**Filed May 27, 1969, Ser. No. 828,161**
**Int. Cl. B22d *11/08***
**U.S. Cl. 164—274** **2 Claims**



Described is a starter bar having a detachable head which when attached to the bottom of a continuous-casting may be detached from the starter bar by lateral deflection of the leading end of the casting relative to the starter bar. The detachable head consists of a cup-shaped chill plate slidably disposed in a recess in the head end of the starter bar. A key is fixedly attached to the bottom of the chill plate with its upper end projecting upwardly and its lower end depending downwardly from the chill plate bottom into a slot extending transversely of the head portion of the starter bar. The upper portion of the key serves as an anchor for the lower end of a continuously formed casting as it solidifies. In practice, the leading end of a descending continuous-casting supported by a starter bar is deflected by a bending roll which deflection causes the key and attached chill plate to slide laterally out of the recess and slot, respectively, of the starter bar head to thus effect separation of the starter bar from the casting.

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**3,643,732**

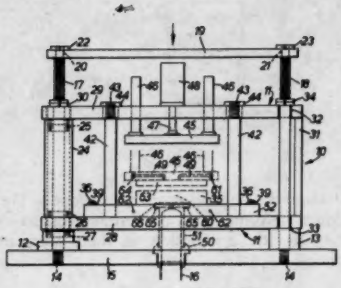
## METAL CASTING APPARATUS

**Jon E. M. Carlsen, 2 Western Ave., Newport, Monmouthshire, England**

**Filed Dec. 16, 1969, Ser. No. 885,544**
**Claims priority, application Great Britain, Dec. 21, 1968, 60,901/68**
**Int. Cl. B22d *17/06, 33/04***
**U.S. Cl. 164—309** **5 Claims**

A low-pressure metal die casting furnace including a top die-supporting structure mounted on a cantilevered support

capable of pivotal movement about a vertical column at one side of the furnace, and also capable of vertical movement under control of a ram to give access to the furnace top. The



ram controlling the top die structure can also be coupled to a lower die-supporting plate, to raise the plate. A single mechanism can serve two adjacent furnaces.

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**3,643,733**

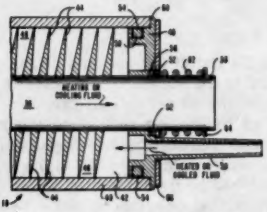
**HEAT EXCHANGER**

**Roger W. Hall, 7008 Stafford Ave., Apt. G, Huntington Park, Calif., and John M. Spicer, Mira Loma, Calif., assignors to said Hall, by said Spicer**

**Filed Feb. 5, 1970, Ser. No. 8,811**

**Int. Cl. F28f 7/00**

**U.S. Cl. 165—81** **9 Claims**



A heat exchanger in which fluid is passed through the inside of an inner tube to heat or cool fluid passing between the outside of the inner tube and the inside of an outer tube concentrically disposed about the inner tube accommodates substantial expansion and contraction of both the outer tube and the fluid to be heated or cooled without leakage or damage to the heat exchanger. The outer tube is made of resilient material so as to expand and contract in response to changes in the volume of the fluid to be heated or cooled, and the heat exchanger is provided with circular end bells between the inner and outer tubes at the opposite ends, one of the end bells being movable axially relative to the inner tube to allow for freezing of the fluid to be heated or cooled and to accommodate axial expansion and contraction of the outer tube. Each end bell includes a pair of elastomeric O-rings disposed between the end bell and different ones of the inner and outer tubes, and the axially movable end bell is restrained by a coil spring and included stop washer mounted on the inner tube adjacent the end bell.

**3,643,734**

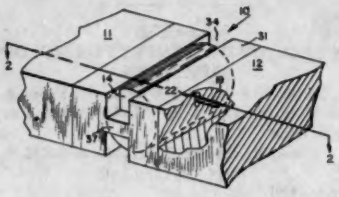
**ANISOTROPIC HEAT VALVE**

**Nicholas H. Deschamps, Ferry, N.H., assignor to Sanders Nuclear Corporation, Nashua, N.H.**

**Filed June 17, 1968, Ser. No. 737,753**

**Int. Cl. F28f 27/00**

**U.S. Cl. 165—96** **12 Claims**



An anisotropic heat valve is provided for use between a heat source and a heat user to regulate flow of heat from the source to the user. A housing overlies an anisotropic member and means are provided for pivoting the anisotropic member to change the thermal conductivity through the member in one direction and thus provide regulation of heat flow through the valve. The valve is particularly useful in conjunction with radioactive isotopic thermal power sources.

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**3,643,735**

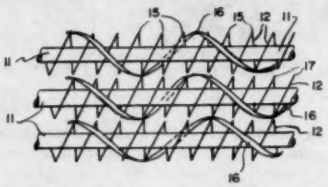
**FIN AND TUBE HEAT EXCHANGER**

**Homer D. Huggins, Racine, Wis., assignor to Modine Manufacturing Company**

**Filed Mar. 10, 1970, Ser. No. 122,757**

**Int. Cl. F28f 1/36**

**U.S. Cl. 165—172** **8 Claims**



A metal fin and tube heat exchanger comprising laterally adjacent tubes and a helical fin around each tube in which each fin tip is closely adjacent the tip of the next fin so that shifting of the tube and its fin under thermal expansion and contraction tends to cause internesting and interlocking of these adjacent tips, and a helical metal strip around and engaging each fin adjacent its tip. Each strip has a pitch differing from that of its fin to provide barriers that block internesting and interlocking of the adjacent fins on relative movement between the adjacent fins.

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**3,643,736**

**SUBSEA PRODUCTION STATION**

**William A. Talley, Jr., Dallas, Tex., assignor to Mobil Oil Corporation**

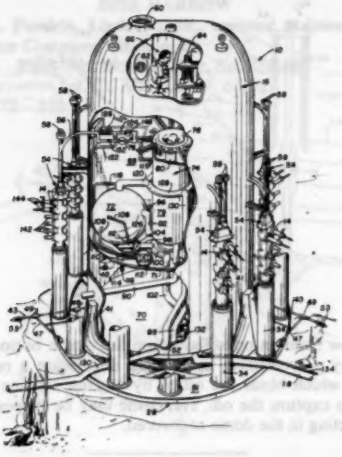
**Filed June 27, 1968, Ser. No. 740,520**

**Int. Cl. E21b 43/01**

**U.S. Cl. 166—.5** **22 Claims**

This specification discloses a method and apparatus for the production of subaqueous deposits of fluid minerals through a subsea satellite system. The wells are drilled in a circular pattern through a template on the marine bottom serving also as base upon which the satellite body is installed. The production and control passages of each of the wells are connected to production equipment within the satellite body by separate connector units, independently lowered into place from a surface vessel, to form portions of fluid paths between the passages within the subsea wellheads and the production

equipment within the shell of the satellite. Such an installation permits production through the satellite, installed on the template base, after only one of the wells has been drilled and completed. The produced fluids are separated and/or metered within the satellite prior to being transported to storage. Flowline tools are programmed to enter the various



subaqueous wells through the connector units. Hydraulic circuitry and controls are provided for pumping the tools and chemicals down through the various wells and for retrieving the tools. Also disclosed is a hot water well utilized in conjunction with the heat exchanger within the satellite for warming the separated-off gases to prevent the formation of hydrates.

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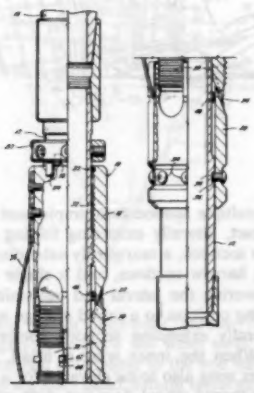
**3,643,737**

## SLIP ASSEMBLY FOR A WELL TOOL

**James H. Current, and Marion D. Kilgore, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.**

**Filed Nov. 27, 1970, Ser. No. 93,102**
**Int. Cl. E21b *23/00***
**U.S. Cl. 166—216** **4 Claims**



An improved slip assembly for a well tool having a mandrel wherein unitary slips are positively held to an upper and lower cone by integral dovetail coacting engaging surfaces with a centering sleeve engaging each slip for maintaining the longitudinal movement of all slips in unison as they are moved outwardly and inwardly with the centering sleeve including an opening for each slip whereby the slip may be connected to the cones by inserting the slips from the interior of the sleeve openings thereby allowing improved slip construction. A tubing anchor utilizing said slip assembly and having a mandrel with the upper cone threadably engaged to the mandrel and a lower cone mounted for rotation on the mandrel but longitudinally secured thereto by shear pins and a bow spring connected to the upper cone for actuating the movement of the slips.

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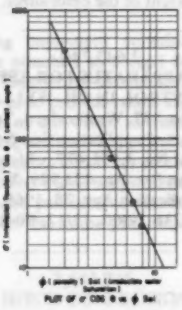
**3,643,738**

## WETTABILITY CONTROL IN AN OIL RECOVERY PROCESS

**Karl D. Dreher, and Michael Holmes, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio**

**Filed May 28, 1970, Ser. No. 41,477**
**Int. Cl. E21b *43/16, 49/00***
**U.S. Cl. 166—252** **6 Claims**



For a reservoir rock having constant lithology (i.e. a given rock type and/or grain size) there exists a linear relationship between the log-log plot of $\sigma$ (interfacial tension) cosine $\theta$ (contact angle) vs. $\phi$ (porosity) $S_{wi}$ (irreducible water saturation). The contact angle (measure of the wettability of the reservoir rock) can be determined at in situ conditions from the above relationship, $\phi$ and $S_{wi}$ obtained from logging data, and $\sigma$ representative of the reservoir fluids. With this in situ determined $\theta$, a more efficient oil recovery process can be designed. For example, if the contact angle is less than 90°, the surfactant within the displacing fluid should have an HLB (hydrophil-lipophil balance) within the range of about 7–40 but if the contact angle is above 90°, the HLB number should be about 0–7. Such a design criteria is especially useful with petroleum sulfonates to obtain emulsion and micellar systems.

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**3,643,739**

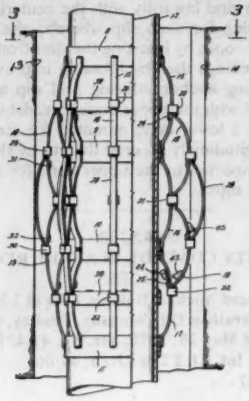
## CENTRALIZER

**John A. Hall, Sr., Weatherford, Tex., assignor to Weatherford Oil Tool Company, Inc., Houston, Tex.**

**Filed Sept. 6, 1966, Ser. No. 577,364**
**Int. Cl. E21b *17/10***
**U.S. Cl. 166—241** **6 Claims**

The new centralizer for well casings consists of a pair of collars connected by bowed leaf springs of different curva-

ture and in stacked or side-by-side arrangement for increas-



ing the resistance of the bows to radial bending and for increasing the radial extent of the centralizer.

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**3,643,740**

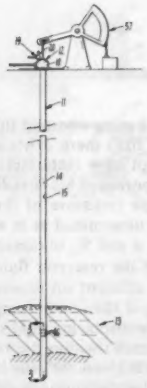
**METHOD AND APPARATUS FOR EFFECTING GAS CONTROL IN OIL WELLS**

**Kork Kelley, P.O. Box 387, Weatherford, Tex.**

**Continuation-in-part of application Ser. No. 650,286, June 30, 1967, now Patent No. 3,451,477, which is a continuation-in-part of application Ser. No. 433,909, Feb. 19, 1965, now abandoned. This application Apr. 28, 1969, Ser. No. 819,606**

**Int. Cl. E21b** *39/00, 43/12;* **F04b** *21/00*

**U.S. Cl. 166—265** **8 Claims**



A method and apparatus for controlling the rate of production of oil wells including a seal at the casing head, an automatic pressure-responsive valve venting the casing to the atmosphere and a gas anchor to assure separation of oil from gas in the producing zone whereby the producing zone is held under controlled even pressures. The gas anchor includes a bucket vertically reciprocable in a housing, a double-acting lost motion valve member attached to the bucket to be pulled off its seat by the bucket, and a tubing string extending into the bucket and closed off by the seat for the valve member.

**3,643,741**

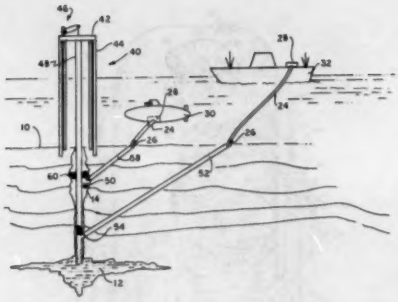
**SEALING OF UNDERWATER FISSURES**

**Salvatore W. Miranda, P.O. Box 5746, Carmel, Calif.**

**Filed Feb. 3, 1970, Ser. No. 8,197**

**Int. Cl. E02d** *3/14;* **E21b** *33/13*

**U.S. Cl. 166—295** **4 Claims**



Oil flow from an open fissure on the ocean bottom is controlled by polymerizing in place in the fissure a resin composition which binds the oil or by placing a dome over the fissure to capture the oil. The dome may be tapped and the oil collecting in the dome recovered.

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**3,643,742**

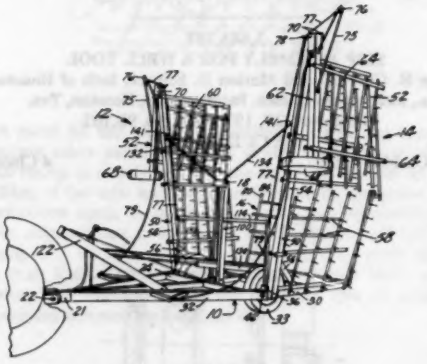
**FOLDUP IMPLEMENT**

**Erwin W. Wellendorf, Ortonville, Minn.**

**Filed Jan. 2, 1969, Ser. No. 788,500**

**Int. Cl. A01b** *63/22*

**U.S. Cl. 172—316** **4 Claims**



A foldable multiple section farm implement having a central wheeled cart, laterally extending folding units for supporting harrow sections, a rearwardly extending tail unit also for supporting harrow sections, and a single lift means for raising and lowering the lateral and tail units from an extended operating position to a raised storage and travel position. The laterally extending sections comprise inner and outer wings. When the inner wing is lifted, a static cable causes the outer wing also to be elevated for a short distance (so that the outboard wheel does not drag on the ground), then to fold down about the hinged junction between the inner and outer wings as the inner wing is further raised. Upon lowering of the inner wing the outer wing unfolds to a

fully extended position without substantial dragging on the ground. Preferably, the initial load on the lift means is reduced by employing a lost motion connection between it and the tail unit whereby the tail unit does not begin to raise until the lateral units have been raised a substantial distance.

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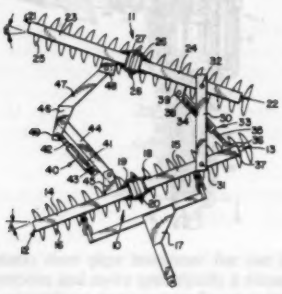
**3,643,743**

## MECHANISM FOR OPENING AND CLOSING AN OFFSET DISK HARROW

**Jerome L. Fueslein, Linden, Calif., assignor to International Harvester Company, Chicago, Ill.**

**Filed Dec. 29, 1969, Ser. No. 888,687**
**Int. Cl. A01b *23/04, 65/02***
**U.S. Cl. 172—320** **1 Claim**



An agricultural implement having front and rear gangs of earth-working tools being interconnected in such a manner that they may easily be adjusted from a transport to a field operating position and also be laterally adjusted with respect to each other to provide the proper tool relationship between said front and rear gangs of earth-working tools for various field operating conditions.

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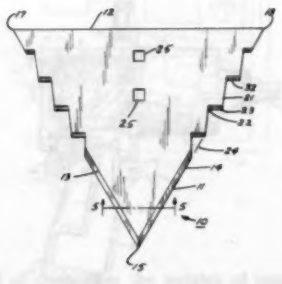
**3,643,744**

## GARDENING TOOL

**Gunnard Turnquist, 230 Alice St., Bloomfield Hills, Mich.**

**Filed May 15, 1969, Ser. No. 824,825**
**Int. Cl. A01b *15/00***
**U.S. Cl. 172—372** **1 Claim**



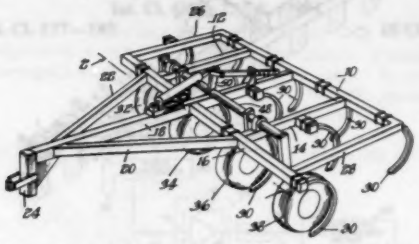
This invention is an improved garden hoe having a generally triangular one-piece flat sheet steel hoeing blade. The blade is attached detachably to the hoe handle by means of step bolts having male quadrilateral surfaces which engage centrally spaced female quadrilateral opening in the blade to prevent turning of the step bolts in the blade. Nuts are provided to secure step bolts, the blade, and hoe handle together as an assembly.

**3,643,745**

## EARTHWORKING IMPLEMENT AND SUPPORT

**Gilbert E. Betullus, and Norman W. Pfeiffer, both of Mount Vernon, Ind., assignors to Chem-Farm Inc., Evansville, Ind.**

**Filed June 25, 1969, Ser. No. 836,521**
**Int. Cl. A01b *63/22***
**U.S. Cl. 172—413** **6 Claims**



An earthworking implement containing a plurality of earthworking tools attached to a rigid frame which is supported by at least four wheel assemblies. The wheel assemblies are spaced so as to provide stable support for the frame when one or more of the wheel assemblies are disengaged from their supporting surface. The wheel assemblies are journaled to supporting struts which are attached to a cylindrical wheel support rod. The wheel support rod is journaled to the frame, and means are provided to rotate the wheel support rod to raise and lower the frame with respect to the wheels.

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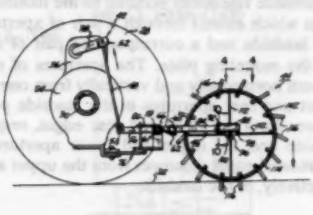
**3,643,746**

## DRAWBAR AND HITCH CONNECTION FOR TRACTOR DRAWN IMPLEMENT

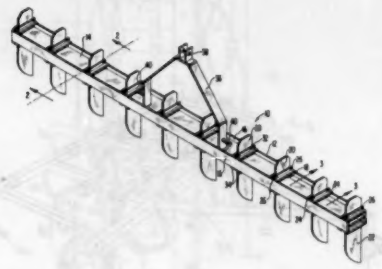
**Arnold A. Dedoes, 2070 West Eleven Mile Road, Berkley, Mich.**

**Continuation-in-part of application Ser. No. 795,853, Feb. 3, 1969. This application Jan. 13, 1970, Ser. No. 2,582**
**Int. Cl. A01b *59/042, 63/102, 45/02***
**U.S. Cl. 172—445** **10 Claims**



A drawbar and hitch connection for coupling implements to a tractor and including means for utilizing the power lift unit of the tractor to transfer a portion of the weight of the tractor to the implement and also including means for disconnecting the implement from the tractor without disturbing the weight transfer means.

3,643,747
**FAIRWAY TOOL BAR CUTTER**
Miller Taylor, and Dewey R. Davis, both of Box 518, Elizabethtown, N.C.
Filed Dec. 5, 1969, Ser. No. 882,797
Int. Cl. A01b *23/04, 45/02*
U.S. Cl. 172—657 5 Claims



A tool bar cutter is formed by an I-beam crossmember having spaced-apart parallel apertures through the center portion of the I-beam member in which apertures are adjustably mounted a plurality of cutter blades.

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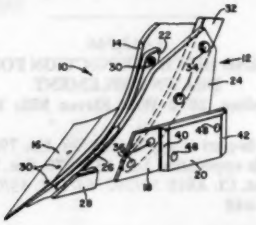
3,643,748
**PLOW BOTTOM**
Charles Woodrow Matthews, East Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed July 31, 1969, Ser. No. 846,527
Int. Cl. A01b *15/00*
U.S. Cl. 172—704 1 Claim



A plow bottom having a reversible landside. The plow bottom includes a frog, a landside mounting plate secured to the frog, and a landside releasably secured to the mounting plate by plow bolts which extend through a pair of apertures provided in the landside and a corresponding pair of apertures provided in the mounting plate. The apertures of each pair are spaced both horizontally and vertically from one another, with the front and rear apertures in the landside positioned equal distances from the front and rear edges, respectively, of the landside and the upper and lower apertures in the landside positioned equal distances from the upper and lower edges, respectively, of the landside.

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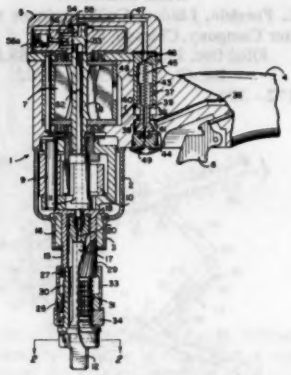
3,643,749
**SIGNAL INHIBITOR FOR IMPACT WRENCH**
Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed July 14, 1970, Ser. No. 54,702
Int. Cl. B25b *19/00*
U.S. Cl. 173—12 8 Claims

A rotary impact wrench containing a motor, a rotary impact mechanism, and a spindle adapted to drive a fastener. A resilient torsion bar is mounted between the motor and the spindle and includes a member for preloading or prewinding the torsion bar so that it does not wind up further until after the torque on the torsion bar exceeds a selected value. A shutoff valve in the wrench is connected to a hollow signal passage extending through the torsion bar and terminating in an exit port which is normally closed by the preloading means and is opened when the torsion bar winds up further in response to the rise of torque on the torsion bar above the selected value of torque, resulting in creating a fluid signal which causes the valve to shut off the power supply to the wrench motor. Means is provided for inhibiting the signal when the speed of the motor is abnormally high to avoid the motor from stopping prematurely. A second embodiment moves the signal passage out of the torsion bar.



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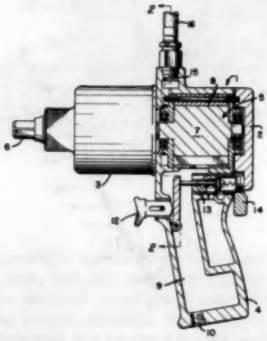
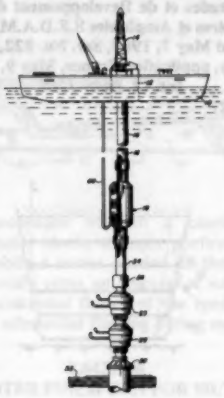
3,643,750
**FLUID POWER TOOL**
Edward L. Allen, Athens, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Sept. 29, 1970, Ser. No. 76,569
Int. Cl. B23b *45/04*
U.S. Cl. 173—170 4 Claims



An air-powered tool having a pistol shape and an air hose inlet located on its body opposite the handle. The inlet is located where the tool will normally hang with its body axis located horizontally and its handle depending when the tool is attached to a vertically suspended air hose.

3,643,751
**HYDROSTATIC RISER PIPE TENSIONER**
Charles D. Crickmer, Box 1348, Houston, Tex.
Filed Dec. 15, 1969, Ser. No. 885,088
Int. Cl. E21b 17/02
U.S. Cl. 175—7 21 Claims



A hydrostatic riser pipe tensioner for use in underwater drilling operations and more specifically a means and method of insuring a resultant net tension force on an underwater riser pipe.

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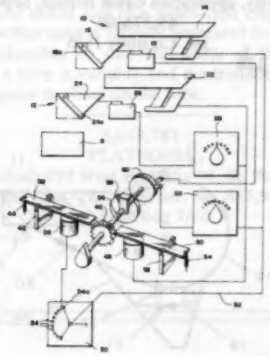
3,643,752
**METHOD AND APPARATUS FOR CONTROLLING PRODUCT CHARGE WEIGHTS**
Stewart B. Blodgett, 12322 Mossycup Drive, Houston, Tex.
Filed Nov. 14, 1968, Ser. No. 775,858
Int. Cl. G01g 13/08, 15/00
U.S. Cl. 177—122 4 Claims



A method of controlling the weights of product charges and reducing product giveaway is provided wherein a predetermined percentage of charges are deliberately held underweight so that a high percentage of the charges are delivered at a weight near the minimum acceptable level. The underweight charges are then brought up to weight by adding additional product so that all charges are delivered at weights above the minimum. A method for maintaining the predetermined percentage of underweight charges are compared to determine whether the predetermined percentage is being maintained and a resultant control signal produced to increase or decrease the amount fed where the percentage is not maintained.

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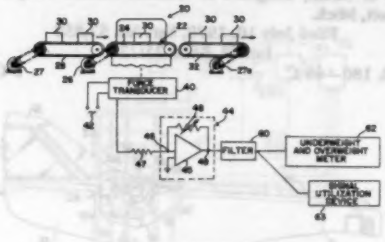
3,643,753
**ELECTRICAL FILTERS FOR WEIGHING SYSTEM CIRCUITS**
Gilbert A. Godwin, Oakland, N.J., and Anthony T. Kirkman, Ravenshead, Nottingham, England, assignors to Howe Richardson Scale Company, Clifton, N.J.
Filed Sept. 3, 1969, Ser. No. 854,994
Int. Cl. G01g 23/10, 11/04
U.S. Cl. 177—185 15 Claims




A weighing system comprising a transducer operatively connected to a load supporting structure for producing a DC analogue signal voltage having an amplitude which represents a weight condition of a load applied to the structure, at least one signal utilization device, and a circuit for transmitting the DC signal voltage to the signal utilization device and including an electrical filter for attenuating undulating voltage superimposed to the DC signal voltage. The filter includes an amplifier and is characterized by a variable impedance connected to the input of the amplifier for selectively varying the time response of the filter without altering the DC gain thereof. The damping coefficient of the filter is a function only of a preselected value of the percentage by which the filter output voltage initially overshoots its steady state value when the transducer voltage is applied as a step input to the filter.

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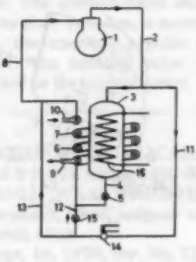
3,643,754
**APPARATUS FOR COOLING A LIQUID**
Tore Brandin, and Sven Yngve David Johansson, both of Norrkoping, Sweden, assignors to Stal Refrigeration Aktiebolag, Norrkoping, Sweden
Filed Feb. 18, 1970, Ser. No. 12,404
Claims priority, application Sweden, Feb. 21, 1969, 2411/69
Int. Cl. F25b 41/00
U.S. Cl. 62—196 2 Claims



An apparatus for cooling liquids comprising a compressor connected to an evaporator, the evaporator having a double-

coil, the inner coil thereof being composed of a metallic material, the outer coil surrounding the inner coil and said outer coil being composed of a nonmetallic resilient insulating material such as plastic or rubber. Spacing provided between the inner and outer coils constitutes a passage for a cooling liquid. Means is provided for introducing hot gas from the high-pressure side of the apparatus to the low-pressure side, that is before the evaporator and after the evaporator. A solenoid valve controlled by a thermostat or pressurestat is used for the regulation of temperature.

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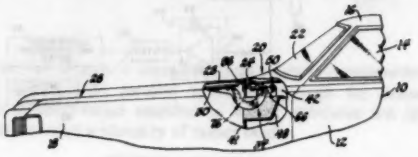
3,643,755

## CLOSURE INSTALLATION

Edmond R. Gionet, Warren, and Neil A. Hull, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 10, 1970, Ser. No. 53,858
Int. Cl. B62d 25/12
U.S. Cl. 180—69 C 3 Claims



An improved hood-type closure installation for vehicles including a closure supported on the vehicle body by a pair of hinge assemblies for movement between open and closed positions relative to an opening in the vehicle body, each hinge assembly including an intermediate support pivotally mounted on the vehicle body for movement between extended and retracted positions. The intermediate supports carry pintles to support the closure for the aforementioned movement between the open and closed positions and are normally maintained by frangible locking means in the extended positions. Forced rearward bodily shiftable movement of the closure generally in the plane thereof initiates fracture of the frangible locking means after which each intermediate support pivots from the extended to a retracted position and simultaneously forcibly constrains the rear edge of the closure to move in a path of motion toward a position below the corresponding edge of the vehicle body opening.

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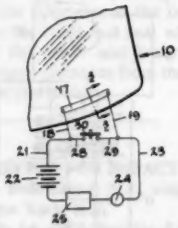
3,643,756

## SAFETY CIRCUIT CONTROL DEVICE

Ivan L. Soreghy, Swanton, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Dec. 16, 1969, Ser. No. 885,411
Int. Cl. B60l 3/04
U.S. Cl. 180—103 5 Claims



This application discloses an automatic safety switch in the form of a strip of silver-frit fired onto a margin of one of the glass sheets in the windshield of an automobile and interposed in the ignition circuit so that breaking of the windshield will cut off all electrical systems, thus stopping the engine and eliminating possible fire, shock and similar hazards.

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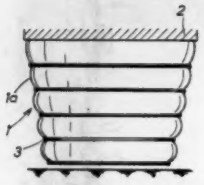
3,643,757

## FLEXIBLE SKIRTS FOR SURFACE-EFFECT MACHINES

Guy Robert Delamare, "Les Iris," Herblay, France, assignor to Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres et Amphibies S.E.D.A.M., Paris, France

Filed May 7, 1969, Ser. No. 822,595
Claims priority, application France, May 9, 1968, 151208
Int. Cl. B60v 1/16
U.S. Cl. 180—127 3 Claims



A skirt for peripherally confining a fluid cushion for a surface-effect machine, comprising a fluidtight flexible sheet encircled by a plurality of transverse hoops made of a material less deformable in the peripheral direction of the skirt than that of the sheet, whereby the said hoops cooperate with the said sheet in such a manner that the height of the skirt automatically decreases when the pressure of the cushion increases.

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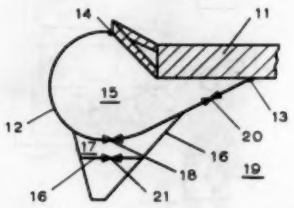
3,643,758

## SKIRTS FOR AIR CUSHION VEHICLES

Anthony Winter, Sandown, England, assignor to British Hovercraft Corporation Limited, Somerset, England

Filed Sept. 9, 1970, Ser. No. 70,230
Claims priority, application Great Britain, Sept. 15, 1969, 45,376/69
Int. Cl. B60v 1/16
U.S. Cl. 180—128 10 Claims



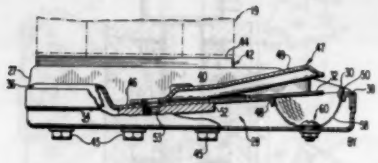
An air cushion vehicle wherein the cushion is bounded in part by a skirt including a plurality of segments extending from the rigid structure of the vehicle and includes a flexible diaphragm extending between and secured to the webs and arcuate part of each segment, the diaphragm extending from a position centrally of the arcuate part to the inner upper edge of each web. The diaphragm, together with the segment and the rigid structure of the vehicle, forms an inflatable compartment separate from the fluid cushion.

3,643,759

## MUFFLER WITH REED VALVE PROVIDING CONTINUOUS VENTING

Jay Richard Bailey, Woodland Hills, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Dec. 28, 1970, Ser. No. 101,572
Int. Cl. F01n 7/10, 1/22, 3/06
U.S. Cl. 181—40 21 Claims



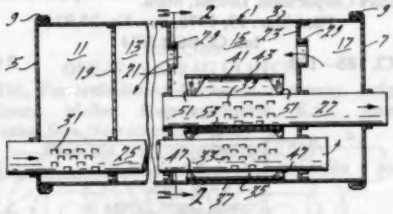
A muffling technique wherein a cantilever-supported spring reed normally blocks a major portion of an exhaust outlet opening while a minor portion of the exhaust outlet opening continuously vents an amount of exhaust gas sufficient to avoid substantial flutter of the reed during engine idle and to avoid substantial floating during engine operation.

3,643,760

## OFFCENTER PINCH CAN FOR MUFFLER

Franklin R. Hubbell, III, Brooklyn, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed May 18, 1970, Ser. No. 38,024
Int. Cl. F01n 1/02, 1/08, 7/18
U.S. Cl. 181—48 5 Claims



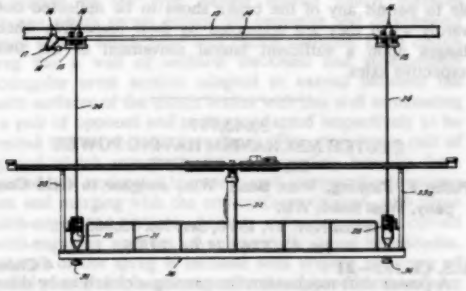
The inlet and outlet axis of a pinch-type chamber forming shell for a muffler tube is radially separated from the centerline of the chamber so that the width of the shell when mounted on a tube is variable and controllable with respect to a given angular position on the tube.

3,643,761

## PLATFORM

Donald F. Melton, 899 West Highway 96, St. Paul, Minn.

Filed Sept. 12, 1969, Ser. No. 857,519
Int. Cl. E04g 3/10
U.S. Cl. 182—19 11 Claims



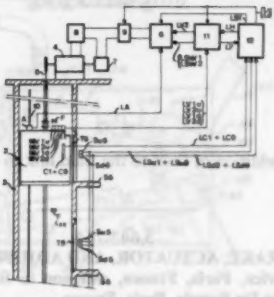
This invention relates to a traveling suspended platform, for use with vertical work surfaces, which is stabilized against oscillation or sway while exerting relatively little force on the vertical work surface.

3,643,762

## METHOD AND APPARATUS FOR CONTROLLING AN ELEVATOR FOR MEDIUM TO HIGH RUNNING SPEED

Marcel Schibli, Kussnacht a.Rigi, Switzerland, assignor to Inventio Aktiengesellschaft, Hergiswil NW, Switzerland

Filed Nov. 16, 1970, Ser. No. 89,996
Claims priority, application Switzerland, Nov. 18, 1969, 17259/69
Int. Cl. B66b 1/30
U.S. Cl. 187—29 R 8 Claims



A nominal value element, an actual value element, a control panel and a selector are operatively associated with a speed regulated drive for an elevator cabin. Those floors lying in the selected running direction are successively searched for the presence of a call and, immediately after starting of the run, a pulse sequence is produced to advance the selector and a counter, in synchronism, step-by-step. Upon discovery of a call by the selector, or when a pulse total greater by one than the number of floors that can be served at a running speed not exceeding a predetermined first velocity, the pulse sequence is interrupted by the counter. In the absence of a call, after interruption of the pulse sequence, and until a call is discovered, the selector is advanced by brake engagement start pulses correlated with a predetermined second velocity. The braking nominal voltage, corresponding to the running speed adjusting itself, is preselected by evaluating the counting position of the counter. The brake engagement starting pulse, to be supplied to the nominal value element, is selected by the starting pulse correlated to the target floor as well as to the selected running direction and to the running speed. The nominal value element includes a time-dependent nominal value setter, a path-dependent nominal value setter, a root former and a discriminator. The control panel includes a selection circuit, connected to shaft switches, a nominal value starter, a blocking circuit, the counter, a pulse generator and a stopping transmitter. The nominal value element and the selector are connected to the control panel.

3,643,763

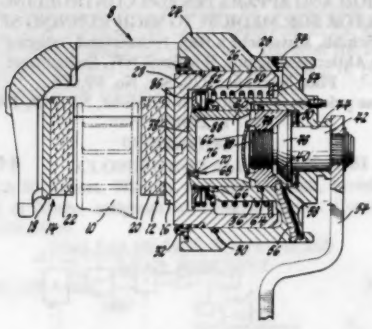
## COMBINATION HYDRAULICALLY AND MECHANICALLY ACTUABLE DISC BRAKE WITH HYDRAULIC WEAR ADJUSTMENT

Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporaiton, Detroit, Mich.

Filed Sept. 16, 1970, Ser. No. 72,641
Int. Cl. F16d 55/20
U.S. Cl. 188—71.8 6 Claims

A disc-brake caliper assembly having a hydraulically actuable primary piston is provided with an extendible member including a fluid link between second and third pistons. The ex-

tendible member acts as a rigid link through which the brake is mechanically actuated and is extendible at the urging of a spring by addition of fluid to the fluid link to adjust for lining wear.



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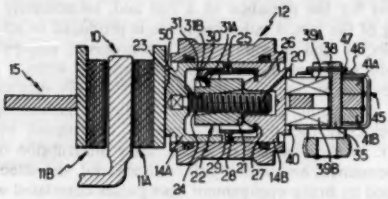
**3,643,764**

**DISC BRAKE, ACTUATOR, AND ADJUSTING MEANS**

**Jean Maurice, Paris, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France**

**Filed Dec. 29, 1969, Ser. No. 888,356**
**Claims priority, application France, Dec. 31, 1968, 182405**
**Int. Cl. F16d *65/52***
**U.S. Cl. 188—71.8** **24 Claims**



A disc-brake system comprising a hydraulic control, a mechanical control, and means for automatically taking up play due to wear of the brake shoes, the said means comprising essentially a notched rod carried by one of the two pistons of the hydraulic operating system and a notched core engaged on the said rod, locking means being provided actuated by the mechanical control for putting the notches of the core into engagement with those of the notched rod.

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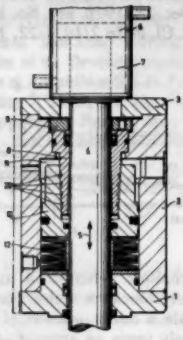
**3,643,765**

**CLAMPING DEVICE FOR AN AXIALLY MOVEABLE PLUNGER SHAFT**

**Siegfried Hanchen, Brunnwiesenstr. 3, 7304, Ruit, Germany**

**Filed Oct. 24, 1969, Ser. No. 869,288**
**Claims priority, application Germany, Oct. 24, 1968, P 18 04 857.2**
**Int. Cl. F16d *65/24***
**U.S. Cl. 188—170** **9 Claims**

A clamping device for an axially moveable plunger shaft as used in electroerosion machine tools where clamping and release must be accomplished without any kind of displacement or distortion of the shaft, clamping being effected by a fixed collet-type clamping sleeve with an exterior taper and a spring-loaded matching female sleeve which takes the form of a moveable hydraulic piston inside a stationary housing.



Hydraulic pressure against the female sleeve releases the normally clamped shaft. The clamping sleeve itself has a slightly tapered bore to provide initial clamping close to the sleeve shoulders.

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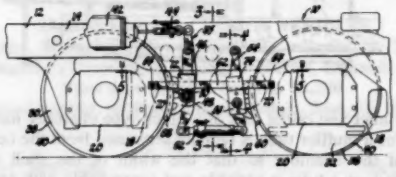
**3,643,766**

**RAILWAY VEHICLE BRAKE RIGGING**

**Roy W. Roush, Jr., Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 19, 1970, Ser. No. 20,924**
**Int. Cl. B60t *8/24***
**U.S. Cl. 188—190** **2 Claims**



In a preferred embodiment, a multiple axle railway vehicle truck has axle and wheel assemblies mounted with relatively large lateral clearances to provide for lateral movement when negotiating sharp curves. The brake rigging is provided with stabilizing means adapted to normally maintain the brake shoes in a desired nominal position relative to the frame so as to be properly aligned with the wheel treads in their centered axle positions, the stabilizing means being resiliently yieldable to permit any of the brake shoes to be deflected outwardly when they are contacted by their respective wheel flanges upon a sufficient lateral movement of the their respective axles.

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**3,643,767**

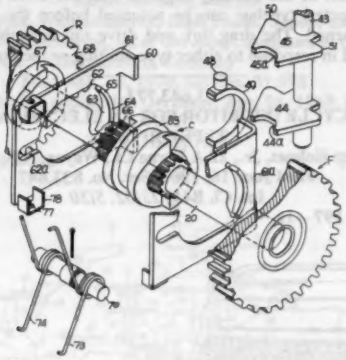
**CLUTCH MECHANISM HAVING POWER DISENGAGEMENT**

**Philip F. Fleming, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.**

**Filed Nov. 27, 1970, Ser. No. 93,063**
**Int. Cl. F16d *11/04, 21/04***
**U.S. Cl. 192—21** **4 Claims**

A power shift mechanism for causing a clutch to be disengaged by the power of the shaft of the transmission. In other words the mechanism is shifted out of gear under its own

power and with little effort on the part of the operator. The mechanism is particularly useful in clutching arrangements for feed rolls of a forage harvester for example, when the rolls become clogged with an excess or slug of material and it is otherwise difficult to shift the clutch out of engagement.



The mechanism includes a shifting assembly which first acts to shift a cam means out of the way to a position that permits the shiftable clutching part to be engaged and reverse feed roll direction, and then acts to permit the cam means to cause the shiftable part of the clutch to be forcibly disengaged due to the power of the shaft on which it is splined.

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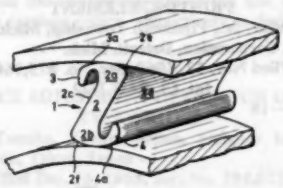
**3,643,768**
**ONE-WAY SPRAG CLUTCH**

**Georg Titt, Furstenfeldbruck-Buchenau, Germany, assignor to Georg Muller Kugellagerfabrik K.G., Aussere Bayreuther Str., Nuernberg, Germany**

**Filed Jan. 29, 1970, Ser. No. 6,725**
**Claims priority, application Germany, Jan. 31, 1969, P 19 04 785.9**
**Int. Cl. F16d *41/07***
**U.S. Cl. 192—41 A** **5 Claims**



Clutches of the type having spaced clutch surfaces between which sprags extend for engaging and disengaging clutch bodies which have said clutch surfaces. Each clutch sprag has a wall of uniform thickness and substantially rectangular cross section adapted to extend between the clutch surfaces of the clutch bodies with this wall terminating in a pair of opposed end surfaces adapted respectively to be directed toward the clutch surfaces. The sprag has a pair of opposed clutch-engaging portions extending laterally from opposed end regions of the sprag wall in opposite directions from and merging with the end surfaces thereof, with these clutch-engaging portions having outer convexly curved clutch-engaging surfaces of substantially equal magnitudes. The wall of the sprag is inclined with respect to a pair of parallel planes which are tangent to the opposed end surfaces of the wall. With this sprag having a substantially Z-shaped profile. The sprag is manufactured from an elongated bar of initially rectangular cross section by cold rolling the bar to provide the laterally projecting portions which extend from the opposed side surfaces of the bar which initially is of rectangular cross section and which is converted by the cold rolling into the profile of substantially Z-shape. After this cold rolling the sprag bodies are simply struck from the bar.

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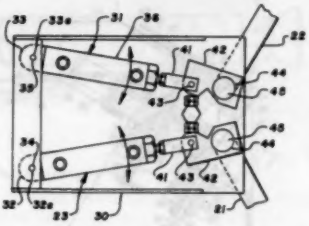
**3,643,769**
**CONTROL FOR HYDRAULIC FORWARD-REVERSE STEERING CLUTCHES**

**Donald H. Hagen, and Donald L. Leopold, both of Hennepin County, Minn., assignors to Ridge Runner, Inc., Minneapolis, Minn.**

**Continuation-in-part of application Ser. No. 27,085, Apr. 9, 1970, now abandoned. This application Nov. 12, 1970, Ser. No. 88,679**
**Int. Cl. F16d *25/10***
**U.S. Cl. 192—51** **2 Claims**



A control mechanism for a dual and selectable drive system, which system includes hydraulically actuated clutches to deliver driving power to either or both driving members whether the driving members are tracks or wheels. Such a drive system commonly known as a caterpillar drive. The control mechanism includes a pair of control arms arranged to actuate a pair of moveable piston elements, the piston elements being of the dual action and accumulator variety. The pistons are directly connected to the clutches for one directional hydraulic control and being connected through the accumulator for the other directional control, and further the arms being arranged through an over center mounting for locking engagement for the other directional control.

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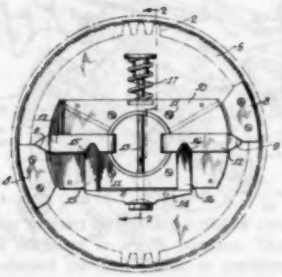
**3,643,770**
**OVERLOAD TORQUE CLUTCH**

**William W. Faulds, R.R. 3, St. Catharines, Ontario, Canada**

**Filed Nov. 16, 1970, Ser. No. 89,684**
**Int. Cl. F16d *11/06, 43/20***
**U.S. Cl. 192—56 R** **7 Claims**



An overload torque clutch in which a pair of slidable fingers on a driving member engage rigidly mounted stops on a

coaxially mounted driven member. The slidable fingers are held in the engaged position by a transverse resiliently loaded yoke member which locates in specially designed recesses in the fingers. At a predetermined torque level of the fingers are forced out of contact with the stops and the yoke rides out of the recesses against the action of the resilient loading. The clutch may be reset manually, hydraulically or pneumatically. The device is particularly useful as a safety clutch to disengage heavy-duty equipment, such as conveyor belt systems, from an electric drive in the event of jamming or the like.

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**3,643,771**

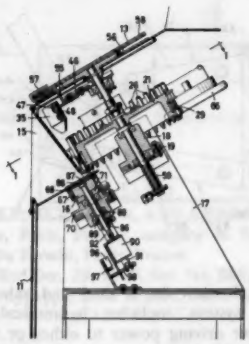
**MEDAL STAMPING MACHINE**

**Kusutugu Takebe, No. 32, Higashi 3-chrome-Abiko, Sumiyoshi-ku, Osaka-shi, Osaka-fu, Japan**

**Filed July 16, 1969, Ser. No. 842,295**

**Int. Cl. B41j *1/30***

**U.S. Cl. 197—6.7** **2 Claims**



A medal stamping device having a finger dial, with a stamp disk beneath the dial, having alpha-numeric symbols, a hammer on one side and a revolvable medal receiver on the other side. Alpha-numeric symbols can be hammered into a medal on the medal receiver by dialing. The device may be coin operated by adding a coin detector and stopper. The dial rotation is stopped unless the correct coin is detected.

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**3,643,772**

**TYPEBAR DRIVE MECHANISM**

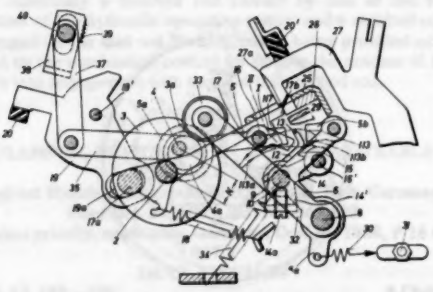
**Arthur Kittel, and Kurt Chvatlinsky, both of Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany**

**Filed Feb. 2, 1970, Ser. No. 7,863**

**Claims priority, application Germany, Feb. 1, 1969, P 19 04 964.0**

**Int. Cl. B41j *23/38, 23/08***

**U.S. Cl. 197—14** **10 Claims**



A typebar drive mechanism for a plurality of typebars has a drag link with a bellcrank and two associated links at the reciprocating end. A drive rail is rotatably mounted on the reciprocating end of the drag link so as to have a pushing edge that describes different paths during the outward and return movements of the reciprocating end of the drag link. A drive pawl is provided for each typebar; each pawl having a pushing tongue arranged to be actuated by the pushing edge during the outward stroke of the drive rail when the respective typebar has been selected. The pushing tongue is also arranged to be in a path other than that of the return movement of the pushing edge, so that the drive pawl of a next-selected typebar can be actuated before the drive rail has returned. The drag link and drive rail assembly can be adjusted in response to either type-shifting or the copy set.

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**3,643,773**

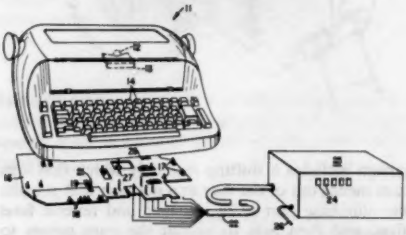
**CYCLE INHIBITOR FOR AN ELECTRICAL TYPEWRITER**

**Lawrence Holmes, Jr., 22 A Byrne Ct., Wayne, N.J.**

**Filed June 16, 1969, Ser. No. 833,647**

**Int. Cl. B41j *23/02, 5/30***

**U.S. Cl. 197—16** **8 Claims**



A typewriter baseplate with means for generating and transmitting electrical signals indicative of print and function cycles of the typewriter and having means for initiating typewriter operation in response to signals from a remote typewriter or computer is provided with mechanism for limiting the maximum cycle repetition rate of the typewriter to adapt to systems having slower signal processing rates. The cycling inhibit mechanism may serve other purposes such as preventing overloading of a buffer storage in the signal circuit and delaying cycling in response to uninterrupted input signals, during the carriage return periods.

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**3,643,774**

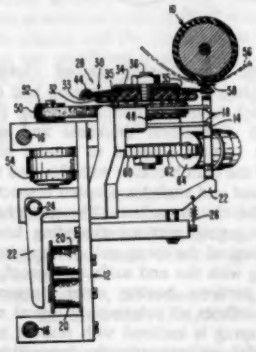
**PRINTING MECHANISM WITH RESILIENTLY BACKED PRINTING ELEMENT**

**Nicholas Kondur, Jr., Plymouth Township, Mich., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Nov. 12, 1969, Ser. No. 875,960**

**Int. Cl. B41j *1/22***

**U.S. Cl. 197—18** **1 Claim**



The disclosure embodies a printing mechanism wherein type is arranged on resilient arms radially extending in a

predetermined angular disposition from a continuously driven rotatable member to position the type between an actuator and an impression means.

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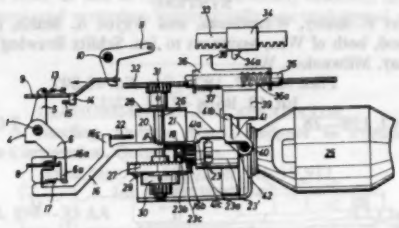
3,643,775

## APPARATUS FOR POWER-DRIVEN TYPEWRITERS AND SIMILAR MACHINES

Arthur Kittel, Wilhelmshaven; Rudi Frank, Sande, and Horst Purr, Wilhelmshaven, all of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Apr. 23, 1970, Ser. No. 31,078
Claims priority, application Germany, Apr. 26, 1969, P 19 21 414.3
Int. Cl. B41j *19/70*
U.S. Cl. 197—66 6 Claims



A mechanism for shifting lines and returning the carriage to its left-margin position in power-driven typewriters and similar machines having a drive motor, and including a manually controlled member for triggering both the line shifting and carriage return operations, two linkages resiliently connected to the member and each arranged for normally producing a respective one of the operations, and various blocking means for selectively blocking the operative connection between the member and either linkage when the operation produced by that linkage is not to occur; particularly for blocking the carriage return linkage when the carriage is already in its left-margin position. A link member resiliently connected by means of a spring to the other of the arm members of the pivotally mounted lever and operable to pivot a crank provided on the clutch to engage that clutch and return the carriage, and reciprocating elements provided to block either the connecting rod or the link when only a line shift or a carriage return, respectively, is desired.

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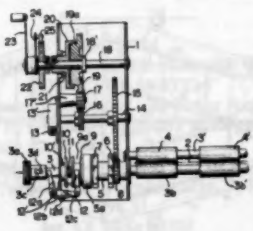
3,643,776

## LINE SPACE ADJUSTMENT DEVICE FOR USE WITH TYPEWRITER

Yoshitsugu Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 16, 1968, Ser. No. 784,073
Claims priority, application Japan, Dec. 20, 1967, 42/81758
Int. Cl. B41j *19/76*
U.S. Cl. 197—114 R 10 Claims



A line space adjustment device for a typewriter comprising a set of ratchet wheels having different pitches to provide different line spacing. Separate engaging levers are selectively engageable with each ratchet wheel, and each of the levers is operated by a common electromagnet and associated linkage to provide a selective desired spacing. Line spacing is also provided by a manually operated release lever.

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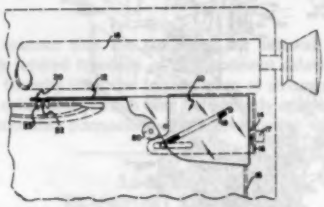
3,643,777

## TYPEWRITER RIBBON CARTRIDGE

Carl P. Anderson, Homer, and Thomas E. Hanson, Syracuse, both of N.Y., assignors to SCM Corporation, New York, N.Y.

Continuation of application Ser. No. 710,185, Mar. 4, 1968, now abandoned. This application July 23, 1970, Ser. No. 64,058
Int. Cl. B41j *33/14, 35/10, 35/04*
U.S. Cl. 197—151 22 Claims



A cartridge for housing a supply of ribbon for typewriters or like machines. The cartridge includes an arm extending therefrom to guide the ribbon from the cartridge to the typewriter print point and to reverse the direction of the ribbon for guiding the ribbon back to the cartridge which is supported on a machine rigid frame on one side of the print point. The arm being capable of carrying the ribbon from a point adjacent the print point to the print point as a ribbon vibrator.

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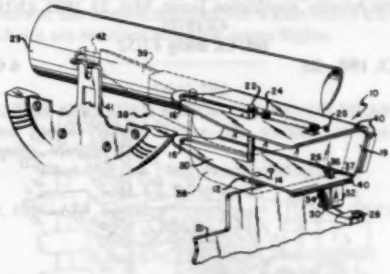
3,643,778

## TYPEWRITER RIBBON CARTRIDGE GUIDE SUPPORT

Carl P. Anderson, Homer, N.Y., assignor to SCM Corporation, New York, N.Y.

Continuation of application Ser. No. 710,064, Mar. 4, 1968, now abandoned. This application Sept. 25, 1970, Ser. No. 75,790
Int. Cl. B41j *33/14, 35/04*
U.S. Cl. 197—151 5 Claims



A typewriter support for guiding a ribbon cartridge to and retaining the cartridge in a rest position. The support includes a U-shaped member which is positioned near the machine side frame, a spring urged detent for retaining the cartridge after it is inserted to a predetermined depth within the guide support, and a biasing means for ejecting the cartridge from the support upon manual release of the detent means.

3,643,779

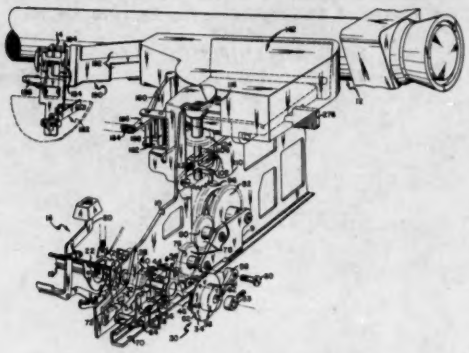
## RIBBON MECHANISM FOR CARTRIDGE SUPPORTED RIBBONS

Carl P. Anderson, Homer; Charles H. Kennedy, Ithaca, and Donald S. Perry, Fayetteville, all of N.Y., assignors to SCM Corporation, New York, N.Y.

Continuation of application Ser. No. 732,343, May 27, 1968, now abandoned. This application Dec. 14, 1970, Ser. No. 98,145

Int. Cl. B41j 35/10, 33/10, 33/14

U.S. Cl. 197—151 24 Claims



A ribbon mechanism for cartridge supported ribbons includes a gear train which is clutch operated in response to typing actuations and which provides incremental rotation to two independent cartridge-type ribbon driving means for feeding a ribbon past the machine print point. The two independent driving means are coaxially mounted and are driven in opposite directions thus accomplishing both a feed means and a takeup means for either a cartridge having an endless ribbon system supported therein or a cartridge having a two spool ribbon system support therein.

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3,643,780

## AUTOMATIC BOTTLE FEEDER

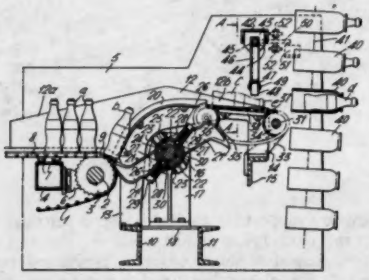
Toshio Shimogaki, Tokyo; Saburo Suzuki, Osaka, and Hiroaki Shigematsu, Nara, all of Japan, assignors to Barry-Wehmiller Co., St. Louis, Mo.

Continuation of application Ser. No. 808,166, Mar. 18, 1969, now abandoned. This application Sept. 24, 1970, Ser. No. 75,302

Claims priority, application Japan, Mar. 22, 1968, 43/18700; 43/18701

Int. Cl. B65g 47/52

U.S. Cl. 198—25 6 Claims



This invention relates to an apparatus for handling bottles being fed to a bottling-washing machine. A plurality of bottles are placed in an upright position on a first conveyor means. At the output end of the first conveyor means is found a plurality of parallel divider plates for forming a plurality of discrete rows of bottles.

A rotatable lift having diametrically extending claw means thereon receives each row of upright bottles and places each bottle in a horizontal position on a second conveyor. Detection means located above the second conveyor serve to produce a detection signal to the operator if the bottle is fed from the second conveyor to the bottle-washing machine conveyor with its bottom directed forward. If this condition is not corrected in a predetermined time, the drive connection to the lift is broken and bottle-feeding operation for the particular row is stopped.

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3,643,781

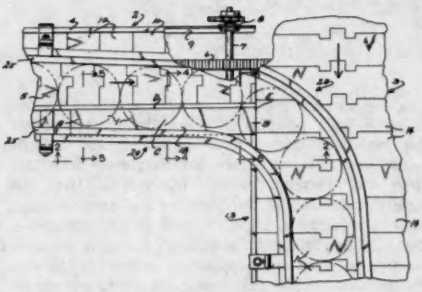
## DEADPLATE CONSTRUCTION FOR A CONVEYOR SYSTEM

Robert F. Risley, Wauwatosa, and Wayne A. Smith, Shorewood, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed May 27, 1970, Ser. No. 40,807

Int. Cl. B65g 47/04, 47/57

U.S. Cl. 198—28 7 Claims



A conveyor system including a pair of conveyors located at right angles with respect to each other. An inclined deadplate is mounted adjacent the side edge of one conveyor and the high end of the deadplate abuts the side edge of the second conveyor. Guide rails are mounted above the conveyors and the articles to be conveyed are conveyed over the first conveyor across the deadplate and drop from the high edge of the deadplate onto the second conveyor.

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3,643,782

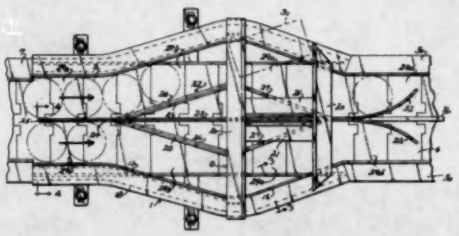
## CONVEYOR SYSTEM HAVING APPARATUS FOR DIVIDING CONVEYED ARTICLES INTO ROWS

Robert F. Risley, Wauwatosa, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Oct. 20, 1970, Ser. No. 82,264

Int. Cl. B65g 47/26

U.S. Cl. 198—30 11 Claims



A conveying system for containers including a mechanism for dividing the containers into separate rows and for

eliminating tipped containers from the rows. The mechanism includes a central dividing wall disposed longitudinally of the conveyor and a pair of sidewalls, each of which defines a passage with the central wall. The upstream portions of the passages diverge outwardly toward the sides of the conveyor and while the downstream portions of the passages converge inwardly toward the longitudinal center of the conveyor. The central dividing wall is inclined upwardly and a tipped, crosswise-oriented container moving along the conveyor will engage and ride up the inclined central wall to automatically tilt the container to an upright position. The portions of the sidewalls which border the discharge or converging portions of the passages are provided with openings and if a tipped, longitudinally oriented container moves through the diverging upstream portion of the passage, it will be directed through the opening to the exterior of the conveyor. The mechanism separates an accumulation of containers into two distinct rows, as well as righting transversely oriented, tipped containers and removing longitudinally oriented tipped containers.

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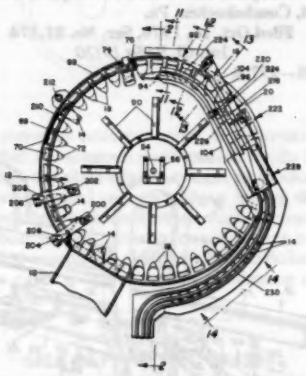
**3,643,783**

## CLOSURE-HANDLING APPARATUS

**Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.**

**Filed Mar. 16, 1970, Ser. No. 19,911**
**Int. Cl. B65g *47/24***
**U.S. Cl. 198—33 AA** **12 Claims**



Closure-handling apparatus designed to effect orientation of relatively narrow elongated and slightly tapered cylindrical closures which are substantially greater in length than in diameter and in which the distribution of weight is substantially equal throughout its length. Randomly arranged closures are deposited on a rotary inclined carrier having a plurality of radially arranged pockets into which the closures are received, those assuming a desired position of orientation being transferred to the mouth of a supply chute.

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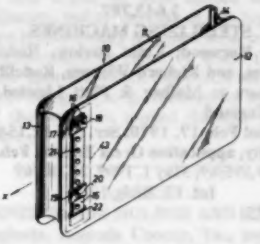
**3,643,784**

## TRANSPORT CONTAINER FOR USE WITH A CONVEYOR SYSTEM

**Heinz Kretzschmar, Wiesensteig, and Franz Naumann, Muhlhausen, both of Germany, assignors to Organisation Ralfs KG, Wiesensteig, Germany**

**Filed Mar. 9, 1970, Ser. No. 17,757**
**Claims priority, application Germany, Mar. 7, 1969, P 19 11 596.9**
**Int. Cl. B65g *43/08***
**U.S. Cl. 198—38** **14 Claims**

A transport container has peripheral walls including a pair of transversely spaced sidewalls which extend in at least substantial parallelism with the intended direction of movement of the container and are composed of flexible material. An elongated contact strip overlies the outer surface of at least one of the sidewalls and has two end portions. At least one of these end portions is connected with the respective sidewall



in such a manner that the strip and the sidewall are connected with limited freedom of displacement relative to one another to thereby limit the transmission of stresses between them. The other end portion may be similarly connected or it may be immovably connected with the respective sidewall.

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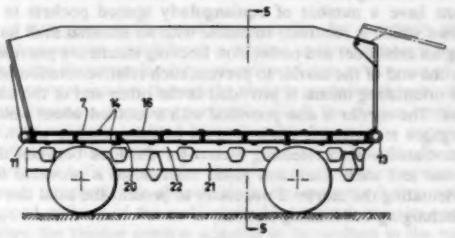
**3,643,785**

## TRANSPORT SYSTEM

**Hans Gunnar Bostedt, 8 Drottninggatan, Hudiksvall, Sweden**

**Filed July 22, 1969, Ser. No. 845,934**
**Int. Cl. B60p *1/36***
**U.S. Cl. 198—75** **3 Claims**



A portable conveyor frame supporting a plurality of conveyors that are simultaneously and individually operative under selective control. Each conveyor has a pair of endless conveyor chains, the chains of each pair being interconnected by dogs movable over and supported on a platform. The platform has longitudinal grooves within which the conveyor chains are received along the upper flights.

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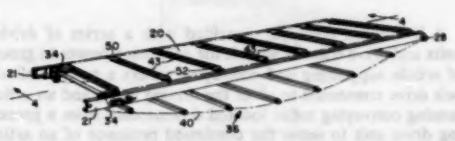
**3,643,786**

## MANURE SPREADER FLOOR CONVEYOR MEANS

**Raymond Steele Wilkes, Moline, Ill., assignor to Deere & Company, Moline, Ill.**

**Filed Aug. 26, 1969, Ser. No. 853,136**
**Int. Cl. B65g *19/02***
**U.S. Cl. 198—173** **10 Claims**



A manure spreader floor conveyor means includes a conveyor that has a pair of spaced endless log or proof-coil

chains interconnected by transverse flights. Specially configured drive and idler sprockets operatively engage the links of the chains and accommodate cylindrical flight connections which interconnect central material engaging portions of the flights with the chains.

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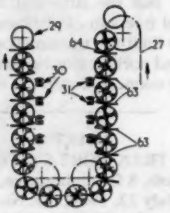
3,643,787

## STERILIZING MACHINES

William Woof, Harwood; Colin Barlow, Radcliffe; Arthur Gray, Sharples, and Richard Wigram, Radcliffe, all of England, assignors to Mather & Platt Limited, Mancheser, Lancashire, England

Filed Feb. 17, 1970, Ser. No. 12,154
Claims priority, application Great Britain, Feb. 20, 1969, 9,195/69; May 1, 1969, 22,181/69
Int. Cl. B65g 17/12
U.S. Cl. 198—131 5 Claims



A sterilizing machine in which the carriers for the sticks of cans have a number of equiangularly spaced pockets in a beam which is relatively rotatable with an external shell having an axial inlet and outlet slot. Locking means are provided at one end of the carrier to prevent such relative rotation and an orientating means is provided at the other end of the carrier. The carrier is also provided with a toothed wheel which engages an agitating chain and an indexing means which is associated with a releasing means for the lock between the beam and shell. Cam and guide mechanism is provided for orientating the carrier if necessary to present the axial slot to discharging and loading stations.

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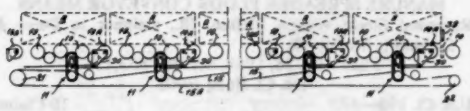
3,643,788

## ACCUMULATION LIVE ROLLER CONVEYOR

Charles W. Werntz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed July 6, 1970, Ser. No. 52,286
Int. Cl. B65g 13/02
U.S. Cl. 198—127 R 8 Claims



A live roller conveyor provided with a series of driving units and drive transfer wheels for delivering power to groups of article supporting and conveying rollers a power delivery belt drive connected to all of the driving units, and an article sensing conveying roller located downstream from a preceding drive unit to sense the continued presence of an article thereon and respond by disabling the associated driving unit so that trailing articles are not caused to exert pressure on leading articles should blockage of a leading article occur.

3,643,789

## LIVE ROLLER CONVEYOR WITH VARIABLE DRIVE

Charles W. Werntz, Ferguson, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed July 6, 1960, Ser. No. 52,285
Int. Cl. B65g 13/02
U.S. Cl. 198—127 11 Claims

A live roller conveyor having a belt drive for the load supporting rollers and means to position the drive belt more or less in friction driving contact with the rollers. The drive belt positioning means includes belt carrier rollers, roller positioning eccentrics and clip-on eccentric brackets, all of which is distributable along the length of a conveyor run to provide local drive variations from zero to maximum available power.

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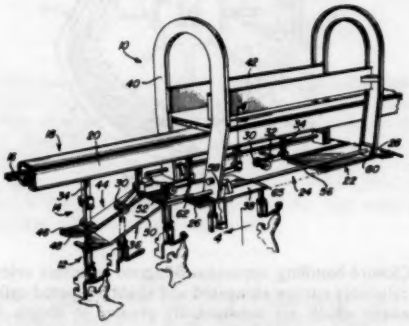
3,643,790

## NONJAM LEAD-ON TRACK FOR CONVEYOR SYSTEMS

William F. Altenpohl, and Paul J. Altenpohl, both of Union Hill Road, Conshohocken, Pa.

Filed Oct. 16, 1970, Ser. No. 81,374
Int. Cl. B65g 17/20
U.S. Cl. 198—177 R 16 Claims



Jamming of article carriers on the lead-on ramp of a track causes displacement of the ramps to retracted positions and stoppage of the conveyor from which the carriers are suspended. The ramps are pivotally mounted by crank elements projecting forwardly from the track and are yieldably held in operative and retracted positions by detents.

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3,643,791

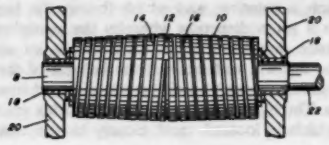
## APPARATUS FOR AUTOMATICALLY CENTERING STRIP

George W. Thornsbery, Modesto, Calif., assignor to United States Steel Corporation

Filed Oct. 14, 1969, Ser. No. 866,351
Int. Cl. B65g 15/32
U.S. Cl. 198—184 2 Claims

A roll for automatically centering and aligning a strip or belt includes a resilient outer sleeve having a helical slot ex-

tending around the roll on each side of a circumferential central slot. One helical slot has a right-hand lay and the other a



left-hand lay. Each slot is inclined radially toward the axis of the roll away from the circumferential slot.

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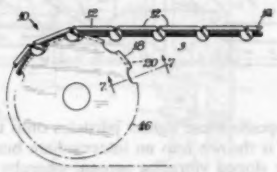
**3,643,792**
**CABLE CONVEYOR**

Baird E. Resener, Indianapolis, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,348
Int. Cl. B65g *17/00*
U.S. Cl. 198—189 5 Claims



A cable conveyor having a series of removably mounted top plates that are snapped over spheres rigidly fastened to the cable. The top plate edges are tapered to allow the conveyor to travel around corners without having the adjacent top plates interfere with each other. Also disclosed is a new sprocket wheel for the cable conveyor having a peripheral groove formed around the sprocket wheel to define a circular path for the cable to travel thereby eliminating chordal action on the cable.

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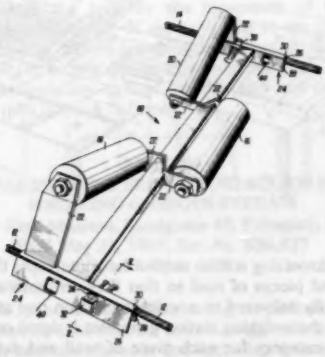
**3,643,793**
**SELF-CAPTIVATING WEDGE**

Daniel J. Diantolio, Nutley, N.J., assignor to Hewitt-Robins, Incorporated, Stamford, Conn.

Filed Feb. 24, 1970, Ser. No. 13,380
Int. Cl. B65g *15/08*
U.S. Cl. 198—192 R 7 Claims



A self-captivating wedge is disclosed which has particular utility in securing idler assemblies onto the side cables of a flexible side frame conveyor and which wedge is formed with a generally wedge-shaped body having a self-captivating means formed at the front end thereof for preventing the wedge from being disengaged from the idler assembly. The self-captivating means consists of a pair of lugs formed on the wedge which extend substantially normal to the sides of the wedge body and a pair of slots formed in the body immediately adjacent, and to the rear of, the lugs. The self-captivating means is specifically designed so as to require a combination of movements in order to insert the front of the wedge into the aperture which captivates the wedge and the lugs are further designed so as to create an interference fit as the front of the wedge is moved through the above-mentioned aperture.

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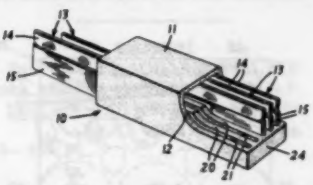
**3,643,794**
**COMBINED BLADE HOLDER AND DISPENSER**

Paul A. Braginetz, Augusta County, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,135
Int. Cl. B65d *83/10*
U.S. Cl. 206—16 B 8 Claims



A one-piece holder and dispenser for flat relatively thin oblong articles which have a thicker portion between their ends the dispenser having a plurality of slots or grooves each adapted to receive the article slidable endwise therein, the slots having a narrower portion in which the thicker portion of the article is wedged but releasable by endwise outward shifting of the article for a portion of its length. In accordance with the specific disclosure the article comprises a paper wrapped hair shaper blade the wrapper being overlapped midway of the ends of the blade which thereby comprises the thicker portion adapted to be wedged in the narrower portion of the respective slot.

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**3,643,795**
**SEED-TAPE AND CARD-SPOOL-AND-ROW-MARKER ASSEMBLY**

Robert P. Watwood, Salinas, Calif., and James A. Moore, Ringwood, N.J., assignors to Union Carbide Corportion, New York, N.Y.

Filed July 17, 1970, Ser. No. 55,666
Int. Cl. B65d *25/10, 77/22*; B65h *75/06*
U.S. Cl. 206—45.14 13 Claims

A seed-tape and card-spool-and-row-marker assembly. A flat, stiff sheet, such as cardboard or plastic, has an upper

spool portion with two generally parallel side edges lying between upper and lower flange portions. The upper flange portions have converging upper edges obtusely inclined to the side edges, and the lower flange portions have converging lower edges obtusely inclined to the side edges and leading to a narrower stem portion. The stem portion has two downwardly converging side edges that lead downwardly from the lower edges to a bottom pointed portion. Where at least one lower edge meets the stem portion, there is an anchor slit. The seed tape is wound around the spool portion and its free end anchored in the anchor slit. The card can be used to aid in unwinding the seed tape when planting it, and then the stem portion can be pushed into the ground, leaving the spool portion to stand as a row marker, which can be labeled with the name of the crop.

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**3,643,796**

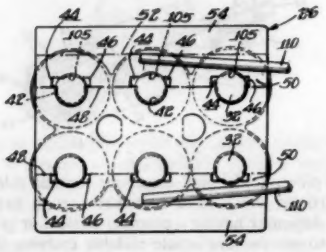
**CONTAINER PACKAGE AND METHOD AND APPARATUS FOR ASSEMBLING SAME**

**Lawrence E. Arneson, 141 West Jackson Blvd., Chicago, Ill.**

**Filed July 7, 1969, Ser. No. 839,284**

**Int. Cl. B65d** *71/00*

**U.S. Cl. 206—65 E** **3 Claims**




A six-pack of bottles is provided by encircling mid portions of the bottles with a retainer and engaging a paper board carrier and retainer beneath the bottle caps. The paper board carrier has rows of apertures formed therein for receiving the upper ends of the bottles, and is assembled with the bottles by conveyor and guide means which advance the bottles and carrier continuously along a path of travel, initially fold sections of the carrier along lines intersecting the apertures for opening the apertures to receive the upper ends of the bottles and then reversely fold the portions of the carriers for closing the apertures and securing the carrier with respect to the bottles.

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**3,643,797**

**TRASH-SEPARATING APPARATUS AND METHOD**

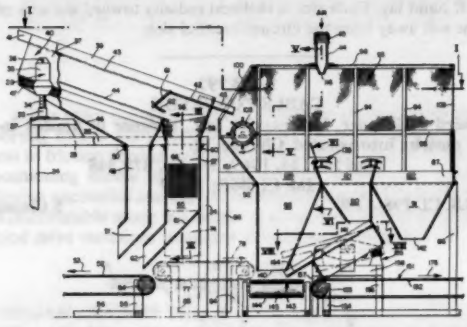
**Lawrence Berkowitz, Willingboro; Georgs Novickis, Lindenwold, both of N.J., and Prafulchandra N. Sheth, Lansdowne, Pa., assignors to Dickson Paper Fibre, Inc., Philadelphia, Pa.**

**Filed July 31, 1969, Ser. No. 846,320**

**Int. Cl. B07b** *15/00*

**U.S. Cl. 209—2** **22 Claims**

A system is provided for reclaiming usable paper other selected materials from a heterogeneous trash mixture that has previously been shredded to a predetermined size. The trash is deposited on a sloped vibrating screen which permits the passage therethrough of smaller sized trash particles. These particles then pass onto another sloped vibrating screen whereby minutely sized particles may pass therethrough, to be discarded. The smaller sized particles that pass through the first screen, but not the second then enter a chute which has a cross current in the form of an air stream, whereby paper, light sheet plastic and the like are forced from the smaller sized mixture and are delivered onto a conveyor. The larger sized particles that do not pass through the first vibrating screen are delivered onto a trash wheel, which is rotating, and which throws the larger sized particles in a given direction whereby the particles travel a given distance depending upon their weight, or upon their ability to be thrown, with at least the heavier of these larger particles passing through an air screen directed toward a series of bins. The lighter of these larger particles are collected in a bin which is located most closely to the trash wheel,



which bin deposits these lighter particles onto the conveyor. Trash which is thrown into an intermediate bin is deposited onto another sloped vibrating screen, whereby larger paper materials are separated from smaller but heavier trash components such as heavier plastics, with the thus separated paper materials also passing onto the conveyor. The conveyor then passes beneath an extractor which removes sheet plastic films and the like therefrom, preferably by means of electrostatic attraction of the plastic films from the paper materials, resulting in paper reclamation having an acceptable minimum percentage (if any) of nonpaper materials therein.

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**3,643,798**

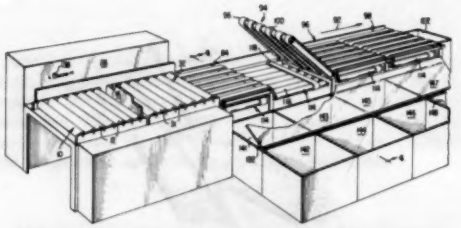
**MAIL WEIGHING AND SORTING MACHINE**

**Edward A. Krupotich, Palo Alto, Calif., assignor to Bell and Howell Company, Sidney, Ohio**

**Filed Feb. 27, 1970, Ser. No. 15,088**

**Int. Cl. B07c** *5/18*

**U.S. Cl. 209—74** **13 Claims**



A synchronizing station sequentially interrupts the travel of serially fed pieces of mail so that they are both aligned and sequentially delivered to a weighing station one at a time. A means at the weighing station generates a signal representing a weight category for each piece of mail and delivers each signal to a memory. The pieces of mail are then moved in a first direction along a track having segments that are selec-

tively pivotable upwardly by means operative in response to signals from the memory. In this manner, selected track segments are thusly pivoted to direct pieces of mail onto separate secondary track segments adapted to move the mail in a second direction. Each secondary track segments is also selectively pivotable about a horizontal axis to selectively direct given pieces of mail along either first or second planes into corresponding first or second bins.

A means is also provided for changing the weight range of the weighing station so that the above described structure is adapted for use with mail falling within a plurality of weight ranges.

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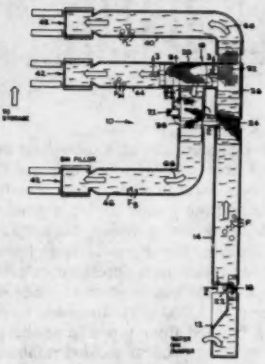
**3,643,799**
**APPARATUS FOR SIZING FRUIT**

**Charles E. Sheetz, Woodstock, Va., assignor to FMC Corporation, San Jose, Calif.**

**Filed Sept. 30, 1970, Ser. No. 76,955**
**Int. Cl. B07c** *5/04*
**U.S. Cl. 209—73** **6 Claims**



A fruit-sizing system comprising a horizontally positioned, generally U-shaped water-filled conveyor tank having a recirculation pumping system connecting the ends of the tank to cause the water therein to continuously flow longitudinally through the tank. Fruit of different sizes is deposited in the water at the end of one of the legs of the tank and is conveyed through the tank by the movement of the water therein. At each corner of the tank and at the end of the other of the legs there is provided an endless sizing conveyor which removes certain of the fruit from the tank while permitting the remainder to flow therethrough and continue in their flow path through the tank.

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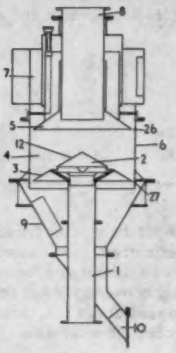
**3,643,800**
**APPARATUS FOR SEPARATING SOLIDS IN A WHIRLING GASEOUS STREAM**

**Bo Gustav Emil Mansson, Sandgatan 40, Enkoping, Sweden**

**Filed May 21, 1969, Ser. No. 826,527**
**Int. Cl. B04c** *3/06*
**U.S. Cl. 209—144** **6 Claims**

A device for separating solids having a cylindrical separating chamber, an axial inlet for introducing a whirling gaseous suspension into said chamber and including an annular plate extending radially outwardly and downward therefrom defining an annular gap with the chamber wall. An upper axially disposed outlet includes an upper annular plate defining an upper annular gap with the wall of said chamber. A scroll



structure imparts a rotary motion to a secondary gaseous stream in the same direction as the feed suspension.

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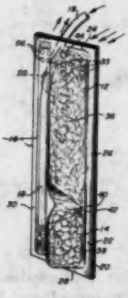
**3,643,801**
**DISPOSABLE AQUARIUM FILTER**

**Harry Zelenko, 150 East 61st St., New York, N.Y.**

**Filed Aug. 22, 1969, Ser. No. 852,190**
**Int. Cl. E04h** *3/20*
**U.S. Cl. 210—169** **9 Claims**



A disposable aquarium filter has a filter medium sealed within a filter housing. The housing has one compartment for the filter medium and another compartment for receiving the end portion of an air supply tube, the compartments being oriented and arranged so that air discharging from the air supply tube functions to circulate water through the filter compartment. When the filter medium becomes contaminated or clogged, the entire filter including the housing with the filter medium therein is discarded. A new, unused filter is installed by withdrawing the air supply tube from the old filter and reinserting it into the new filter.

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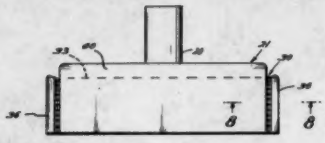
**3,643,802**
**BILGE SCAVENGER**

**Andrew D. Jackson, Jr., Route 2, Box 524, Brownsville, Tex., assignor to Lee W. Pohl; Jack G. Carinhas, Jr., both of Cameron County, Tex., part interest to each**

**Filed Oct. 17, 1969, Ser. No. 867,188**
**Int. Cl. E03b** *11/00*
**U.S. Cl. 210—172** **15 Claims**

Scavenger comprises inverted channel-shaped body to be positioned with lower edges of sides resting on bilge bottom. A screen, shaped correlative to body lines, is spaced from sides of body. The screen is carried by a plate pressed

between lower side edges of body. Screen and plate form a removable, box-shaped receptacle for trash filtered out of water by screen. Outlet nipple at top of body is to be connected to pump which sucks water into body through end openings of receptacle. Replaceable end covers for receptacle each comprise an elastic plastics frame snapped over end of receptacle. Frame carries gate formed of a plurality of flexible, elastic plastics material, flat, tapered fingers secured to top of frame. Fingers overlap lower edge of frame on inside so they can swing in but not out, thereby to trap trash by admitting trash to receptacle and retaining same therein.



## 3,643,803
## SECTION FOR DISC FILTER APPARATUS

**Edward A. Glos, II, Deerfield, Ill., assignor to Gladys M. Glos; Thomas C. Nathan and Jack W. La Follette, part interest to each**

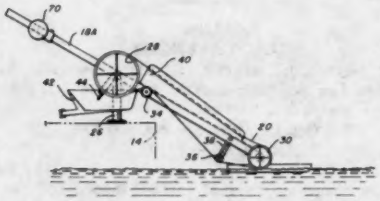
**Continuation-in-part of application Ser. No. 598,077, Nov. 30, 1966, now Patent No. 3,491,886. This application Jan. 19, 1970, Ser. No. 3,851**
**Int. Cl. B01d** *33/26*
**U.S. Cl. 210—232** **12 Claims**

A polygonal section for filter apparatus in which each section consists of a hollow open-faced frame connected to a vacuum source with a perforated panel overlying each open face, and a stretcher element for holding filter media taut over the panel, accessible from one margin of the frame, and which may be removed from the section and apparatus independently of the frame and panel.

## 3,643,804
## WASTE OIL RECOVERY UNIT

**Dallas E. Sharpton, P.O. Box 444, Dewey, Okla.**

**Filed Sept. 24, 1970, Ser. No. 75,214**
**Int. Cl. C02b** *9/02*
**U.S. Cl. 210—242** **2 Claims**

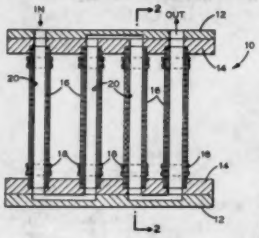


An endless conveyor belt having an affinity for oil is mounted on the bow of a barge and projects downwardly and forwardly therefrom towards a water surface having oil floating thereon. Buoyancy means located at the lower end of the belt are adjustable such that the lower run of the belt can be selectively positioned slightly below the interface of the water and oil to assure maximum oil absorption with minimum water pickup.

## 3,643,805
## A MEMBRANE SYSTEM WHICH INCLUDES A TUBE SHEET FOR SECURING SUPPORTED MEMBRANE TUBES THEREIN

**Robert R. Hoffman, Clark, N.J., assignor to Abcor Water Management Company, Inc., Cambridge, Mass.**

**Filed Jan. 20, 1970, Ser. No. 4,256**
**Int. Cl. B01d** *31/00, 13/00*
**U.S. Cl. 210—321** **11 Claims**

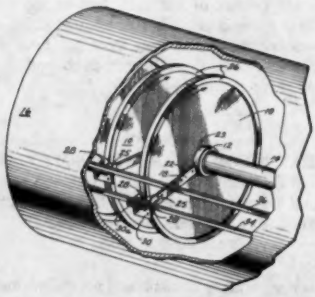


This disclosure is concerned with a tube sheet for holding a bundle of braided fiber support tubes in place for use in a reverse osmosis or an ultrafiltration system. The tube sheet is formed of a thermosetting plastic having a process temperature below the temperature at which the support tube will melt, degrade or deform. The thermosetting plastic is molded to the braided fiber tubes under pressure to provide a seal between the support tube and tube sheet when subjected to pressures in excess of 1,000 p.s.i. In order to prevent displacement of the braided fiber tubes from the plastic tube sheet during the molding process molded retaining members are provided which are molded to the tubes and tube sheet.

## 3,643,806
## ADJUSTABLE KNIFE BLADE FOR DRY FILTER CAKE DISCHARGE

**Theodore H. O'Cheskey, Whittier, Calif., assignor to United States Filter Corporation, Whittier, Calif.**

**Filed Mar. 24, 1969, Ser. No. 809,522**
**Int. Cl. B01d** *29/34*
**U.S. Cl. 210—327** **8 Claims**



An elongated knife blade spans the surface of a filter leaf, with its inner end making a loose fit around the central shaft of the filter. After the filtration process, the blade is held sta-

tionary and the filter leaf is rotated under it to remove the filter cake which has accumulated on the leaf. The spacing between the blade and the surface of the leaf is adjustable so that the cake left on the leaf can be set to the desired thickness. The leaf can be rotated relative to the blade during filtration to continuously remove cake from the leaf and thereby increase the concentration of solids in the liquid circulated through the filter.

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**3,643,807**

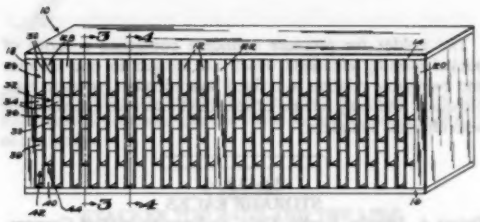
**FILING CABINET**

**Harry F. Childs, Route 28 South Orleans Road, P.O. Box 427, Orleans, Mass.**

**Filed June 24, 1970, Ser. No. 49,249**

**Int. Cl. B42f 17/00**

**U.S. Cl. 211—10** **1 Claim**



A filing cabinet having a plurality of rows or tiers of open compartments arranged in a novel manner such as to reduce the overall height of the cabinet for accommodating a predetermined number of compartments and to facilitate placing and removing of articles into and from the compartments.

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**3,643,808**

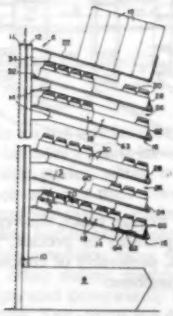
**GRAVITY FEED MERCHANDISING RACK**

**James D. Ryan, and Raymond L. Hoagland, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.**

**Filed Sept. 2, 1969, Ser. No. 854,481**

**Int. Cl. A47f 5/00, 7/00**

**U.S. Cl. 211—49 D** **10 Claims**



Flat-ended containers are shipped in cartons and arranged therein in a single layer so that the flat sides rest on the carton base. To merchandise the containers the carton tops are removed, while the containers remain in the open box, and a plurality of boxes are vertically stacked in a rack spacing the cartons sufficiently to permit removal of the containers from the cartons. The rack inclines the cartons so that the containers slide downwardly along the carton base towards the lowermost side of the carton from where the containers are removed.

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**3,643,809**

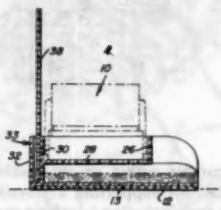
**HOLDER FOR CREDIT CARD RECEIVING MACHINE**

**David H. Donnan, Corpus Christi, Tex., assignor to Guaranty National Bank and Trust of Corpus Christi**

**Filed Jan. 26, 1970, Ser. No. 5,874**

**Int. Cl. A47f 7/00**

**U.S. Cl. 211—49** **6 Claims**



A receptacle having a plurality of bins underlying a tray which receives a credit car imprinter. Charge forms are placed in the bins. A pocket is formed in the rear of the receptacle for accommodating an enlarged card for advertising or for explaining use of the imprinter.

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**3,643,810**

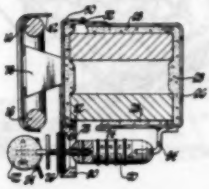
**DEVICE FOR CARRYING AND SECURING SKI EQUIPMENT**

**Samuel M. Highberger, 5543 Westwood Lane, Birmingham, Mich.**

**Original application July 11, 1968, Ser. No. 744,197, now Patent No. 3,568,902. Divided and this application Dec. 17, 1970, Ser. No. 99,173**

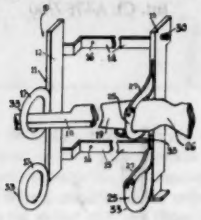
**Int. Cl. A47f 7/00**

**U.S. Cl. 211—60 SK** **12 Claims**



A device for use in carrying and securing ski equipment including a U-shaped member and a hinged member that is lockable with respect to the U-shaped member after the U-shaped member and hinged member are positioned around a pair of skis that are disposed in back-to-back relationship. The device also includes a pivotable member for locking ski poles into a fixed position, the pivotable member being positioned so that a single locking plunger can tie together the U-shaped member, the hinged member, and the pivotable member thereby adapting the device to be carried or alternatively secured to a fixed object.

3,643,811
**LOCKING GUN RACK**
Glen Howerton, Rural Route, Julinetta, Idaho
Filed Aug. 4, 1969, Ser. No. 847,187
Int. Cl. A47b *81/00*
U.S. Cl. 211—64 3 Claims



A rack securable within an automotive vehicle, the rack being adaptable for supporting a plurality of rifles or shotguns, and the rack including a locking means for securing the firearms and preventing theft thereof when the vehicle is open.

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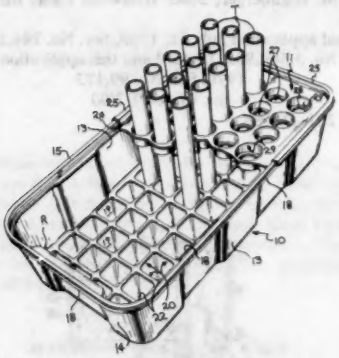
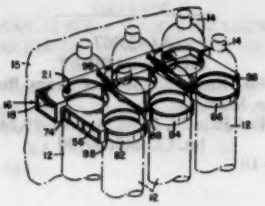
3,643,812
**TUBE STORAGE RACK**
Robert J. Mander, Mays Landing; Duane E. Ramm, and Robert J. Simms, both of Vineland, all of N.J., assignors to Owens-Illinois, Inc.
Filed June 12, 1970, Ser. No. 45,725
Int. Cl. A47b *73/00*
U.S. Cl. 211—74 2 Claims



A storage rack for culture tubes or similar tubular articles is vacuum-formed from a plastic material, such as polypropylene and comprises two separably connected elements, one being a boxlike member with upstanding peripheral walls and a floor having a plurality of wells in which to receive the lower end of culture tubes or such articles and restrain them against lateral displacement and which also are provided with bottom drain openings for discharge of condensation. The other separably connected element which is in the form of a cover, or toppiece, separably attachable to the upper margin of the upstanding peripheral walls, has vertical, tube-receiving apertures with depending guide sleeves which are coaxial with the wells and which aid in initial placement of such tubes or articles in the rack.

3,643,813
**HOLDER FOR PRESSURE CYLINDERS**
Robert J. Noonan, 1178 West Seymour, Cincinnati, Ohio
Filed Apr. 6, 1970, Ser. No. 25,732
Int. Cl. A47b *73/00*
U.S. Cl. 211—75 14 Claims



The holder for pressure cylinders comprises a series of pocket-forming elements which are hinged to one another and swingable relative to a fixed base member, so as to enable quick and easy release of spent cylinders for replacement with charged cylinders.

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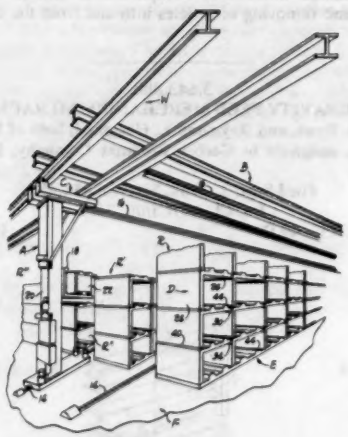
3,643,814
**STORAGE RACKS**
Stuart A. Martin, Euclid, Ohio, assignor to McNeil Corporation, Akron, Ohio
Filed Sept. 12, 1969, Ser. No. 857,440
Int. Cl. A47f *5/00*
U.S. Cl. 211—177 6 Claims



Pigeonhole-type storage racks, shelves, stands and the like constructed of a plurality of precast, molded or extruded duplicate members, preferably of concrete secured together by metal parts or members.

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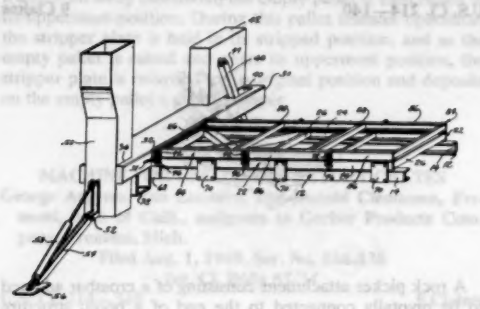
3,643,815
**MOBILE DERRICK**
Roy Balogh, St. Louis County, Mo., assignor to McCabe-Powers Body Company, St. Louis, Mo.
Filed June 23, 1969, Ser. No. 835,445
Int. Cl. B66c
U.S. Cl. 212—1 11 Claims

A mobile derrick includes a chassis frame and a mast frame rigidly mounted on the chassis frame. A mast is rigidly

secured to the mast frame and extends upwardly therefrom for supporting a derrick at its upper end. A body is mounted over the chassis frame in a manner which permits it to be



free from rigid connection with the mast so as to allow the mast, mast frame, and chassis frame to deflect independently of the body.

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**3,643,816**

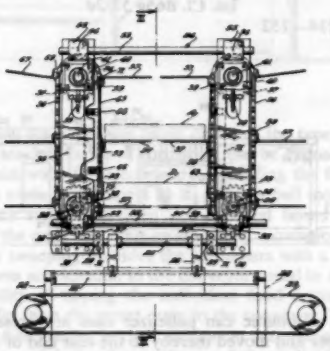
**STACKER FOR BAGS AND THE LIKE**

**Paul W. Jacobsen, Kiel, Wis., assignor to H. G. Weber and Company, Inc., Kiel, Wis.**

**Filed May 25, 1970, Ser. No. 40,317**

**Int. Cl. B65g *57/03***

**U.S. Cl. 214—6 H** **10 Claims**



Counter and stacker for flat articles such as paper bags and the like. The stacker includes a frame having laterally spaced vertically extending side guides, which may be adjusted to converge towards each other at their lower ends. Conveyor chains move downwardly along the guides. The chains have spaced flights extending horizontally therefrom towards each other, with the flights extending from opposite chains registering with each other during downward travel of the flights to provide separated downwardly movable platforms spaced along the chains. The chains are driven by a Geneva drive mechanism to provide dwells in downward travel of the flights to accelerate and decelerate the flights and establish a series of holding areas during the periods of dwell, and to advance the flights downwardly ahead of the articles stacked at accelerated speeds when initially traveling from a holding station. The stacker is driven by the bag machine at a speed related to the delivery speed of the bag machine to effect the stacking of a preselected number of bags and to thereby count the bags stacked. The speed of the stacker may be varied in accordance with the size of stacks selected.

**3,643,817**

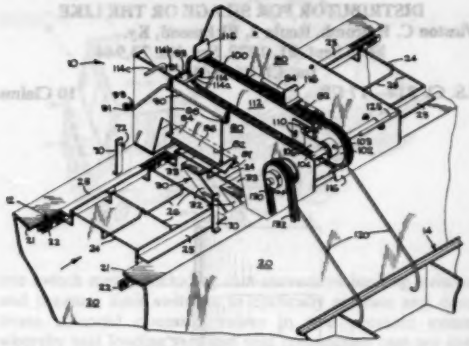
**COMBINATION STACKER-FEEDER**

**Boyd W. Rose, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.**

**Filed Sept. 16, 1970, Ser. No. 72,706**

**Int. Cl. B65g *57/30***

**U.S. Cl. 214—6 BA** **13 Claims**



A combination stacker-feeder for filler flats which includes a member for lifting the flats individually from a primary conveyor onto a pair of opposed supports which are cammed outwardly by the upwardly moving flat. When it is desired to feed the flats individually from the supports, an endless chain conveyor having spaced pusher lugs thereon is positioned between the supports with its lower run in the plane of the supports. The endless conveyor is intermittently energized by the lifting of each flat so that the flat will be engaged by one of the lugs to be slid off the supports and moved laterally of the primary conveyor. When it is desired to stack the flats upon the supports, the endless chain conveyor is arranged for pivotal movement about one end thereof so that it can be rotated completely out of the stacking area.

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**3,643,818**

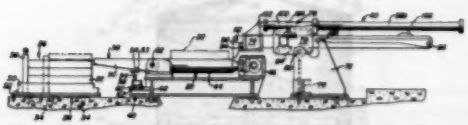
**STACKING DEVICE**

**Francis Gallucci, North Huntingdon Township, Pa., assignor to United States Steel Corporation**

**Filed Oct. 30, 1970, Ser. No. 85,588**

**Int. Cl. B65g *57/10***

**U.S. Cl. 214—6 G** **33 Claims**



A stacking device for a longitudinal member being transported along a predetermined path of movement is disclosed. Arresting means are disposed along the predetermined path of movement for arresting the longitudinal member adjacent to a preselected location. The stacking device has a stacked supporting means adjacent the preselected location on one side of the predetermined path of movement. A movable guide means is disposed on the one side of the predetermined path of movement and is operable to guide longitudinal member from the predetermined path of movement and are reciprocable between a rest position and a stacking position to move the longitudinal member from the predetermined path of movement over the guide means and onto the stack supporting means. Elevating means are connected to the

movable guide means for moving the guide means, after delivery of the longitudinal member to the stack supporting means, so that the guide means is aligned with the top of the stacked longitudinal member preparatory for the transfer of another longitudinal member by the stacking device onto the stacked longitudinal member on the stack-supporting means.

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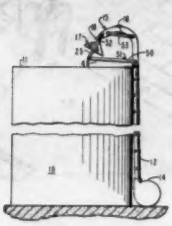
**3,643,819**
**DISTRIBUTOR FOR SILAGE OR THE LIKE**
Winston C. Halcomb, Route 2, Richmond, Ky.
Filed Sept. 21, 1970, Ser. No. 73,944
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CB 10 Claims



A pyramidal-shaped body is rotatably mounted beneath the outlet end of a silage supply pipe. Each side of the body has a fin thereon with the fin being slightly divergent to a junction between the side of the body on which the fin is mounted and an adjacent side of the body remote from the fin. The body is adjustably positioned relative to the outlet end of the supply pipe in both vertical and angular directions.

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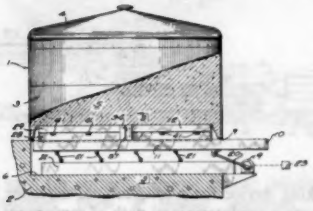
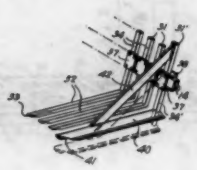
**3,643,820**
**FLOW CONTROL BAFFLE FOR A BIN UNLOADER**
Ronald W. Hammond, Villa Park, Ill., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jan. 19, 1970, Ser. No. 3,673
Int. Cl. B65g *65/44*
U.S. Cl. 214—17 D 8 Claims



A flow control baffle is disposed over a conveyor operating in a channel pit at the bottom of a storage bin. The baffle extends upward into the bin and has inclined baffle walls which channel the stored material around the sides of the baffle into the conveyor. The baffle has a bottom surface disposed over the conveyor and has elongated ribs extending below the bottom surface to establish the level of stored material in the conveyor. A vibration motor assembly is used to agitate the baffle independently of the conveyor.

**3,643,821**
**FRONT LOADER-TYPE ROCK PICKER**
Floyd W. Viel, P.O. Box 632, Billings, Mont.
Filed Aug. 7, 1970, Ser. No. 61,929
Int. Cl. B65g *61/00*
U.S. Cl. 214—140 9 Claims



A rock picker attachment consisting of a crossbar adapted to be pivotally connected to the end of a boom structure swingably carried by the front portion of a tractor, the boom structure being provided with hydraulic cylinders for pivoting the crossbar around a transverse horizontal axis. Side-by-side L-shaped members are adjustably clamped to the crossbar, the L-shaped members having forwardly projecting bottom arms defining prongs.

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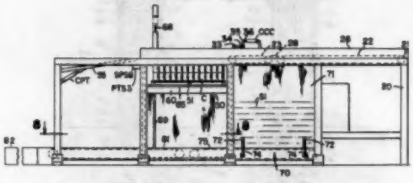
**3,643,822**
**CAN PALLETIZER**
Thomas D. Birchall, Turlock, Calif., assignor to G. W. Hume Company, Turlock, Calif.
Original application July 16, 1968, Ser. No. 745,274, now Patent No. 3,522,890. Divided and this application Feb. 17, 1970, Ser. No. 14,857
Int. Cl. B65g *57/24*
U.S. Cl. 214—152 10 Claims



In this automatic can palletizer cans are presented to a long draper and moved thereby to the rear end of a normally stationary short draper having at its forward end can clamps normally holding a front row of cans. A stripper plate lies adjacent the forward end of the short draper, and cans are delivered to it at transfer time. A hoist supports a pallet beneath the normal position of the stripper plate and raises a pallet to a level slightly below the stripper plate. A switch on the long draper releases the can clamps when a desired number of cans have been backed up behind the front row, and thereupon the short draper moves cans onto said stripper plate. Switches are actuated by the cans reaching a stripping wall at the end of the stripper plate, and they reenergize the can clamps, stop the short draper, and cause said stripper plate to move out beneath the stripping end wall and drop the cans onto the pallet or onto a layer of cans already on said pallet, to make a palletized can layer. The hoist is then lowered by the height of one layer of cans and is stopped. The stripper plate then returns to its original position adjacent the short draper. Each time the stripper plate reaches its fully stripped position it picks up a paper sheet the size of the area of the pallet, carries it with it on its return, and releases the paper sheet over the layer of cans. After a preselected number of layers has been deposited on the pal-

let, the hoist is automatically lowered and the loaded pallet transferred away from said hoist to a dock where it can be picked up and moved elsewhere. Meanwhile, a stack of empty pallets is retained adjacent the hoist, and one empty pallet is transferred to the hoist as the filled pallet is being transferred away therefrom, the empty pallet is then raised to its uppermost position. During this pallet transfer operation, the stripper plate is held in its stripped position, and as the empty pallet is raised and nears its uppermost position, the stripper plate is returned to its original position and deposits on the empty pallet a sheet of paper.

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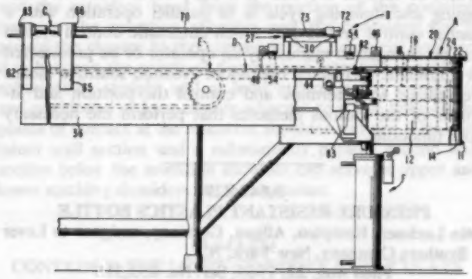
**3,643,823**

## MACHINE FOR UNLOADING RETORT CRATES

**George Argyres, San Leandro, and Donald Clendenen, Fremont, both of Calif., assignors to Gerber Products Company, Fremont, Mich.**

**Filed Aug. 1, 1969, Ser. No. 846,838**
**Int. Cl. B65g 65/34**
**U.S. Cl. 214—310** **5 Claims**



A machine for unloading retort crates of the type wherein successive stacked layers of containers can be exposed above the crate sidewalls for unloading by elevating the false bottom of the crate with respect to its sides. A bail mounted to the machine sweeps elevated and exposed layers of containers off the crate and onto an adjoining, moving conveyor. The bail in sweeping provides the containers with a substantially uniform acceleration to the conveyor speed to minimize the possibility of tipping the individual food containers in their transfer from the retort crate to the conveyor. The containers are free floating in their movement with respect to the bail so as to minimize the tendency of the individual containers to be broken or damaged during sweeping and to permit the containers during movement of the bail to frictionally orient themselves into a compacted mass. Provision is made to drive the bail by direct coupling to a single hydraulic cylinder.

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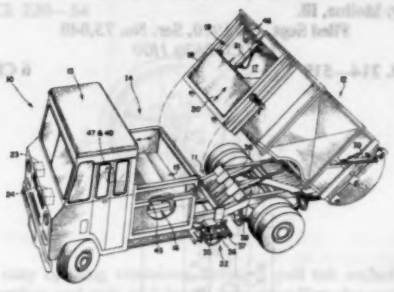
**3,643,824**

## AUTOMATIC PACKER CYCLE FOR REFUSE-CARRYING APPARATUS

**Harvie C. Partridge, Port Credit, Ontario, Canada, assignor to Smithpac Canada Ltd., Toronto, Ontario, Canada**

**Filed Apr. 8, 1970, Ser. No. 26,700**
**Int. Cl. B60p 1/28**
**U.S. Cl. 214—510** **1 Claim**

A refuse carrying vehicle receives refuse into a receptacle mounted thereon. An aperture extends through a wall of the receptacle for alignment with a carrying chamber pivotally mounted on the vehicle for movement between a horizontal position and a tilted dumping position. A hydraulic ram pushes refuse horizontally from within the receptacle through the aperture into the chamber, a second hydraulic compacting ram is located in said carrying chamber to plunge vertically onto the refuse in said chamber. A hydraulic pressure system is mounted on the chassis for operating the loading ram and the refuse-compacting ram and is controlled by electric switch means including ram movement limiting switches and pressure limit switches to cyclically activate and deactivate solenoid operated valves in said pressure system whereby said loading ram and said compacting ram are continuously synchronously reciprocating.



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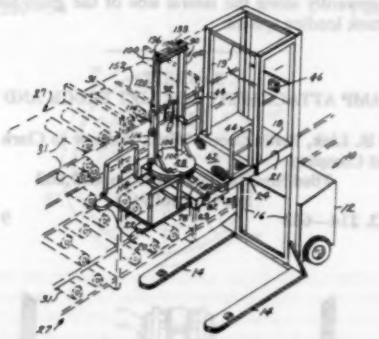
**3,643,825**

## SIDE-LOADING ARTICLE-HANDLING ATTACHMENT

**Edward Robert Zane, Jr., Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.**

**Continuation of application Ser. No. 698,293, Jan. 16, 1968, now abandoned. This application Dec. 1, 1969, Ser. No. 881,101**
**Int. Cl. B66f 9/14**
**U.S. Cl. 214—512** **17 Claims**



The side-loading article-handling means is in the form of an attachment designed to be mounted on the vertically movable fork of a conventional lift truck, such as a so-called "order picker truck" or "hi-rider," and adjacent to the conventional operator platform or cage customarily mounted on the fork of such trucks. The article-handling attachment comprises a carriage adapted to be moved at right angles to the prongs of the fork, a turntable rotatably mounted on the carriage, a mast structure rigidly secured to the turntable, a second smaller carriage mounted on the mast for vertical movement relative thereto, and an article-handling means mounted on the second carriage. Hydraulic rams are produced as exemplary structure for effecting the various movements of the operative parts of the attachment, during use, and they are operatively connected to the conventional control panel, or the like, provided in the operator's cage, to

be under the control of an operator as the fork is raised, lowered, or held stationary during use.

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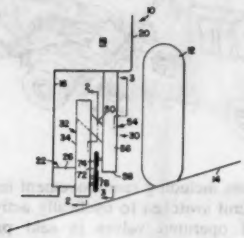
3,643,826
COMBINE CLEAN GRAIN ELEVATOR
Marlin Earle Weakly, Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed Sept. 17, 1970, Ser. No. 73,048
Int. Cl. B63p 1/00
U.S. Cl. 214—519 6 Claims



A hillside-type combine has a main separator body and an elevated grain tank mounted on the main separator body in a laterally overhanging disposition. A laterally extending auger-type conveyor collects the clean grain at the bottom of the body and feeds a first clean grain elevator, which extends upwardly alongside the body sidewall below the overhanging grain tank. The first clean grain elevator feeds a downwardly inclined chute which delivers the clean grain to a second elevator disposed outwardly of the first, the bottom end of the second elevator being substantially above the elevation of the bottom of the first clean grain elevator and delivering the grain upwardly along the lateral side of the grain tank to a grain tank loading system.

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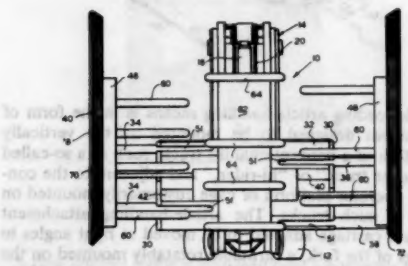
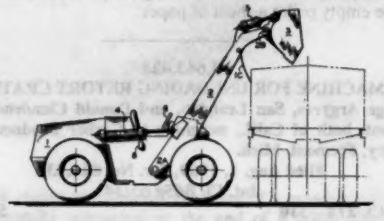
3,643,827
CLAMP ATTACHMENT FOR LIFT TRUCK AND THE LIKE
David H. Link, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Nov. 24, 1969, Ser. No. 879,063
Int. Cl. B66f 9/18
U.S. Cl. 214—653 9 Claims



A clamp attachment especially for lift trucks in which the elements of each of a pair of pivotal clamp pad and supporting clamp arm assembly provide a substantially coplanar and continuous clamping surface.

3,643,828
AUTOMATIC CONTROL SYSTEM FOR FRONT END LOADER
James H. Elliott, 1441 Stoneygate Lane, Columbus, Ohio
Filed July 9, 1969, Ser. No. 840,367
Int. Cl. E02f 3/00
U.S. Cl. 214—762 4 Claims



Automatic control system for a front end loader utilizing a bucket or fork at the end of a rigid boom. An automatic digging and dumping cycle is in parallel operation with a manual control system and which automatic control system may be changed to manual by an operator or be preselected for automatic or manual operation. Pressure sensitive means are utilized to determine and control the position and attitudes of the various elements that perform the necessary work functions.

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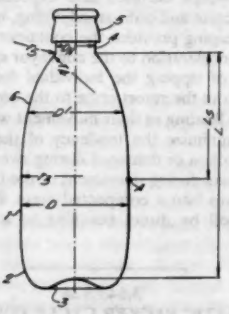
3,643,829
PRESSURE-RESISTANT PLASTICS BOTTLE
Otto Lachner, Kempten, Allgau, Germany, assignor to Lever Brothers Company, New York, N.Y.
Filed Aug. 22, 1969, Ser. No. 852,315
Int. Cl. B65d 1/02
U.S. Cl. 215—1 C 5 Claims



A blow-molded plastics bottle for carbonated drinks has a shoulder region, above a cylindrical main part, of height 0.5 to 0.6 of the bottle height and formed with an externally convex curvature, the radius of the curvature of which progressively decreases from less than infinity adjacent the main part to a value lying between 0.5 D and 2 D where D is the diameter of the main part. Between the shoulder and a cylindrical neck of the bottle is an externally concave curve of maximum radius 6 millimeters.

3,643,830

## PACKAGING CONTAINER AND CLOSURE THEREFOR

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Feb. 5, 1970, Ser. No. 8,961
Int. Cl. B65d 51/16, 43/10, 21/02
U.S. Cl. 220—44 R 5 Claims

A container having a closure retention shoulder is combined with a closure having a retention bead. The closure is formed so that the portion thereof between the closure rim and the retention bead grips the portion of the container between the retention shoulder and the container rim to secure the closure to the container. The container wall section between the points of the rim and retention shoulder is substantially straight and at least approximately parallel to and positioned at least closely adjacent to a line through the points of contact at the retention shoulder and rim. This container wall section and a substantially parallel second wall section below the retention shoulder can serve as upper and lower stacking shoulders for the container.

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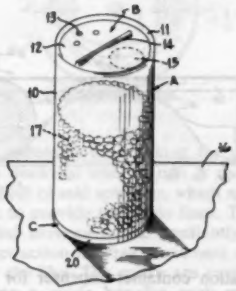
3,643,831

## CONTAINER FOR LIGHT-SENSITIVE PARTICULATE SOLIDS

Lee A. Casper, 323 Cherry Bend, Merion, Pa.

Filed Jan. 21, 1970, Ser. No. 4,599
Int. Cl. B65d 41/00
U.S. Cl. 220—42 B 4 Claims



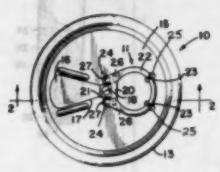
A container for light-sensitive particulate solids is generally cylindrical with opaque walls and top. The latter may be of any of the conventional dispensing types. The bottom, however, is of transparent material and is preferably in the form of a clear plastic plug. When stored normally on a shelf, the contents are shielded from light. However, when the container is removed temporarily from its position of rest on a horizontal surface, the contents may be observed through the transparent bottom.

3,643,832

## PULL TAB ARRANGEMENT FOR EASY-OPENING CONTAINER

Nick S. Khoury, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,529
Int. Cl. B65d 17/24, 21/02
U.S. Cl. 220—54 4 Claims



An easy opening container having a pull tab including a ring portion and pair of fulcrum legs straddling the weakening line defining a removable panel portion. The pull tab includes an attachment panel hingedly connected to the ring portion and between the fulcrum legs. The attachment portion receives a rivet formed integral with the removal panel portion. Cooperating means are formed on the pull tab and the panel for minimizing the stresses on the integral rivet. Wells disposed below the ends of the fulcrum legs reduce the force required to tilt the pull tab to a position in which the legs are the ends of a fulcrum lever.

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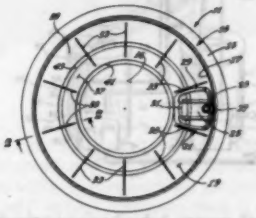
3,643,833

## EASY OPENING CONTAINER WALL

Ermal C. Fraze, 355 West Stroop Road, Dayton, Ohio, and Franklin C. Eickenhorst, Mason, Ohio, assignors to Ermal C. Fraze, Dayton, Ohio, a part interest

Filed Nov. 4, 1969, Ser. No. 873,889
Int. Cl. B65d 17/24
U.S. Cl. 220—54 7 Claims



An easy opening container wall including a main score line in the container wall defining a panel removable therefrom and a tab connected to the panel to initiate severance of the panel. A plurality of generally radially extending secondary score lines are formed in the panel and sections of the panel are preferably axially offset relative to each other.

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3,643,834

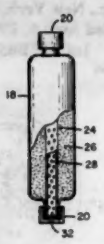
## ACID DISPENSERS FOR DRY-CHARGED BATTERIES

Anthony Sabatino, St. Paul, Minn., assignor to Gould Inc., St. Paul, Minn.

Filed Nov. 24, 1969, Ser. No. 879,359
Int. Cl. B67d 5/08
U.S. Cl. 222—54 11 Claims

An acid dispenser with a perforated tube mixing channel and two openings each of which is sealed by means of a rubber gasket held in place by a water-soluble pellet. The

dispenser is placed inside a battery. When water is added to the battery the pellet dissolves releasing the gasket and allowing the acid within the container to mix with the water in the channel and in the battery.



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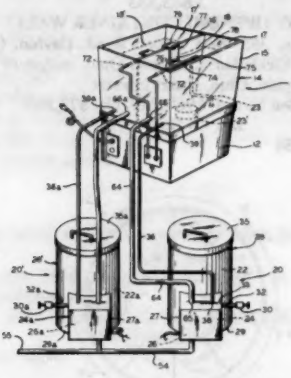
**3,643,835**
**AUTOMATIC LIQUID PROPORTIONER**
**Leonard G. Popinski, Chicago, Ill., assignor to The Nedlog Company, Chicago, Ill.**
**Continuation-in-part of application Ser. No. 739,806, June 25, 1968, now Patent No. 3,528,587. This application Feb. 13, 1970, Ser. No. 11,132**
**Int. Cl. B67d *5/08***
**U.S. Cl. 222—56** **13 Claims**



An automatic liquid proportioner device for simultaneously feeding a predetermined amount of one liquid and a predetermined amount of another liquid into a beverage dispenser machine to provide a beverage comprising a mixture of said liquids.

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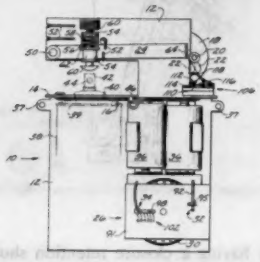
**3,643,836**
**PROGRAMMED TIMER DEVICE AND DISPENSING APPARATUS INCORPORATING SAME**
**William Grayson Hunt, 322 McRae St., Laurinburg, N.C.**
**Filed Dec. 18, 1969, Ser. No. 886,251**
**Int. Cl. B67d *5/20***
**U.S. Cl. 222—70** **8 Claims**

A self-contained and readily portable apparatus for at adjustably variable desired times dispensing desired amounts of liquid-spray or other material from containers such as pressurized aerosol cans, the apparatus including a drive motor and a driven linkage effective upon actuation and during each cycle of operation of the drive motor to momentarily depress the container's spring-biased discharge valve. The frequency at which cycles of operation are instituted is adjustable and is controlled by a novel timer device including a clockworks mechanism having an hour hand output shaft upon which is mounted a disc element having on one surface a plurality of electrically conductive segments arranged in circular sets concentric with and at varying radial distances from the central axis of the disc, the circumferential spacing between the segments being equal within each set and different from set to set. An electric contact is mounted for adjustment radially of the disc surface so as to overlie any desired set of conductive segments thereon, and so as to sequentially and periodically engage the segments of such set during disc rotation. Engagement between the contact and a conductive segment completes a circuit including the drive motor and its power source, which comprises a battery pack from which the clockworks mechanism is also energized, instituting a cycle of operation. The cycle is terminated by engagement between a switch element in the circuit and a cam member of the motor-driven linkage. Intermediate successive cycles of operation, a second contact engaging the disc surface actuates the motor momentarily to disengage the cam member and the switch.



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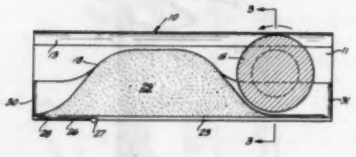
**3,643,837**
**COMBINATION CONTAINER-DISPENSER FOR VISCOUS MATERIALS**
**Ronald A. Green, 559 North Olive St., Orange, Calif.**
**Filed Aug. 25, 1969, Ser. No. 852,560**
**Int. Cl. B65d *35/28***
**U.S. Cl. 222—101** **13 Claims**



A combination container-dispenser for viscous materials comprising an elongated tubular container which is open along one side thereof, the ends of the container along the open side extending inwardly of the container. A roller or slider having first and second grooves therein is positioned within the container so that the inwardly extending ends of the container project into the grooves. By confining the viscous material within the container and by providing an opening in one end of the container, movement of the roller or slider forces the viscous material out of the opening. In addition, the interlocking connection between the ends of the container and the grooves in the roller or slider eliminates the need for a rigid, nondistortable container. Finally, a novel closure, including a slider which cooperates with an opening in the container, eliminates the standard nozzle and cap.

3,643,838

## FOOD SEASONER APPARATUS

Wilford W. Allen, 323 Vista Pl., Los Angeles, Calif.

Filed Apr. 27, 1970, Ser. No. 32,127
Int. Cl. A47g 19/24
U.S. Cl. 222—161 3 Claims

A commercial solid-particle food seasoner has a thin wall right cylinder length, each cylinder end being closed, the cylinder length and the closures cooperatively form the wall of a seasoning container. At least one seasoning filling aperture is formed in the container wall and has a detachable sealing closure. A multiplicity of seasoning-dispensing apertures are disposed in the cylinder length wall area bounded by a minor cylinder arc and the cylinder length. The seasoning container has a shaft coaxially secured to the pair of end closures and a container support shaft mount cooperatively holding the container in a superimposed horizontal position above a food preparation area. A handle secured to the shaft adapts the container to shaking and dispensing the contained seasoning.

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3,643,839

## FERTILIZER SPREADER MARKING SYSTEM

James R. King, 6804 Capstan Drive, Annandale, Va.

Filed July 9, 1969, Ser. No. 840,417
Int. Cl. A01c 15/00
U.S. Cl. 222—177 15 Claims

A method and apparatus for marking the coverage of a lawn spreader are disclosed wherein one or more spikes are attached to the wheel of said spreader, which spikes serve to lift tufts of thatch to provide the guide lines. The spikes are mounted for radial movement and resiliently biased outwardly to allow retraction for free movement of the wheels over sidewalks or the like. The spikes are carried on an integral hoop having a guide box for each spike and the resilient means is in the form of a spring steel hoop engaging the upper portion of the spikes.

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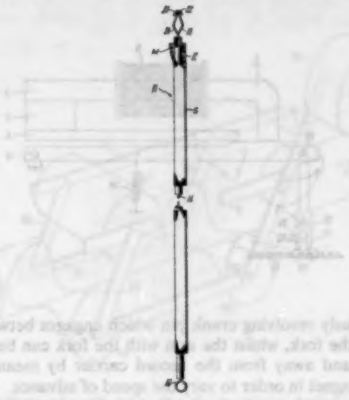
3,643,840

## DEVICE FOR EVERTING A SLEEVE OF FLEXIBLE MATERIAL

Placide N. LeBlanc, 194, Jerry Road, East Hartford, Conn.

Filed Aug. 24, 1970, Ser. No. 66,434
Int. Cl. A41h 43/00
U.S. Cl. 223—42 11 Claims

A device for everting a sleeve of fabric material without injury to the material. The device is comprised of a tubular member and a pair of resilient catches which project from one end of the member to engage a sleeve of material to be everted. The catches engage and pull the end of the fabric



sleeve within the end of the tubular member. The sleeve can be everted by sliding the remainder of the sleeve over the end of the tube where the end of the sleeve is caught by the catches.

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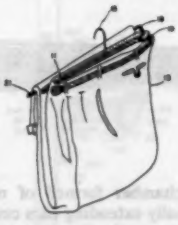
3,643,841

## HANGER

Walter H. Rhindress, 62 North Harbor Drive, Ocean Ridge, Fla.

Filed Nov. 5, 1969, Ser. No. 874,099
Int. Cl. A47j 51/12
U.S. Cl. 223—95 4 Claims



A hanger having spring-loaded means for gripping the inner waistband of trousers and a projecting arm for receiving folded trouser legs particularly for bedside use, inside the waistband to keep the pants smooth, permit wrinkles to fall out, and prevent the pockets from emptying; at the same time permitting the leg portions to be folded over the arm in order to present a very short profile, such that they can be hung along one's bedstand.

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3,643,842

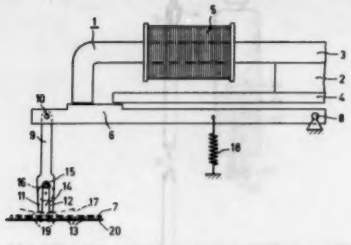
## CLAW MECHANISM FOR ADVANCING A PERFORATED RECORD CARRIER ALONG A PATH

Johan van der Maaden, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,707
Claims priority, application Netherlands, Jan. 24, 1969, 6901273
Int. Cl. G03b 1/22
U.S. Cl. 226—71 6 Claims

A claw mechanism for advancing a perforated record carrier, in particular a film, in a cinematograph film projector,

which mechanism comprises a pivotable arm arranged parallel to the direction of advance and a forked claw member which is arranged at right angles to the direction of advance and is hinged to the arm, the claw member being moved by a



continuously revolving crank pin which engages between the teeth of the fork, whilst the arm with the fork can be moved towards and away from the record carrier by means of an electromagnet in order to vary the speed of advance.

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**3,643,843**

**YARN SUPPLY CHAMBER**

**Jiri Havlas; Premysl Kostelecky; Zdenek Holy, all of Liberec; Jeromir Rydlo, Vesec u Liberce, and Vlastimil Rejnart, Krizany, all of Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia**

**Filed Feb. 13, 1970, Ser. No. 11,072**
**Claims priority, application Czechoslovakia, Feb. 21, 1970, 1258/69**
**Int. Cl. B65h *17/32***
**U.S. Cl. 226—97** **9 Claims**

A yarn supply chamber formed of regularly displaced, generally longitudinally extending bars connected at one end by a yarn introducing mechanism and at the other end by a closure having a yarn discharge orifice. The bars may be disposed at an angle of from about 0°to 20° with respect to the longitudinal axis of the chamber, the chamber preferably increasing in diameter in the direction of passage of yarn therethrough. The chamber virtually eliminates the formation of loops in the yarn reserve supply. Upon the interruption of the feeding of yarn into the chamber while continuing its withdrawal, the discharge end of the chamber remains substantially uniformly filled with yarn.

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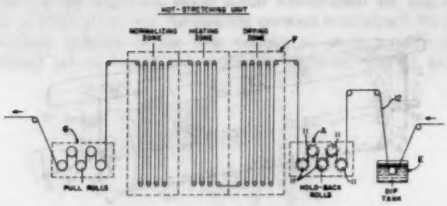
**3,643,844**

**APPARATUS FOR TENSIONING FABRIC**

**Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Division of Ser. No. 616,337, Feb. 15, 1967, Pat. No. 3,517,425**
**Filed Mar. 9, 1970, Ser. No. 22,727**
**Int. Cl. B65h *23/18***
**U.S. Cl. 226—111** **9 Claims**

Apparatus for tensioning fabric such as tire cord fabric in which the fabric is pulled through one or more treatment chambers under substantial tension. The tension is created in an assembly of holdback rolls and the fabric is elongated during its passage through the assembly of rolls. Torque is applied to the shafts of the rolls through friction clutches which slip when a predetermined torque is exceeded, the clutches



being adjusted so that the rolls accommodate their speeds to variations in the speed of the web due to the elongation of the material without slippage taking place between the web and the rolls.

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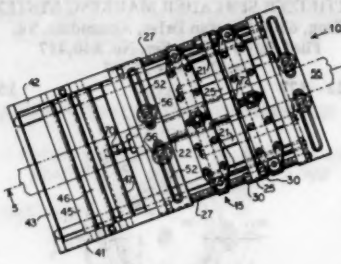
**3,643,845**

**APPARATUS FOR FEEDING STRIP STOCK**

**Odis L. Phillips, Halls, Tenn., assignor to Phillips Industries, Inc., Frankfurt, Ind.**

**Filed Dec. 18, 1969, Ser. No. 886,186**
**Int. Cl. B65h *17/36***
**U.S. Cl. 226—145** **4 Claims**



Strip stock feeding apparatus including a pair of diaphragm operated clamps, one movable and one stationary. A fluid cylinder is arranged to move the movable clamp back and forth. The two clamps are alternately actuated at the same time as the fluid cylinder so as to hold the stock in position while the movable clamp moves in one direction and so as to move the stock with the movable clamp as it moves in the opposite direction. Coil straightening rollers and guiding rollers are also provided.

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**3,643,846**

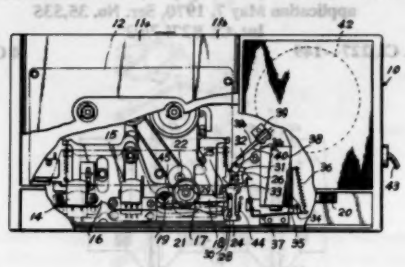
**TEMPORARY STOP DEVICE FOR TAPE RECORDER**

**Yoshiro Kato, Yokohama, and Kimio Uno, Kamakura, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan**

**Filed June 19, 1969, Ser. No. 834,767**
**Claims priority, application Japan, June 22, 1968, 43/5239**
**Int. Cl. B65h *17/22***
**U.S. Cl. 226—181** **4 Claims**

A temporary stop device for tape recorder temporarily or transiently stopping the running of a tape by parting a pinch roller from a rotating capstan which is contacted with the pinch roller by compression and thereafter instantly running

the tape by contacting the pinch roller with the capstan. Contacting and parting operations of the pinch roller with and from the capstan are made by a cam means. A cam operation



switch and a tape running indication part are housed in a remote control part at some distance apart from the tape recorder body.

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3,643,847

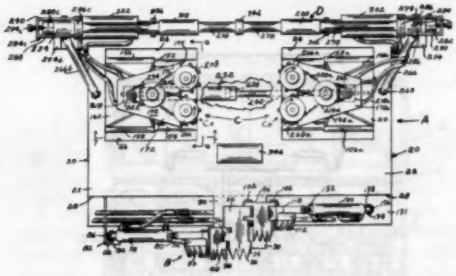
**DEVICE FOR GRIPPING AND MOVING A FELLED TREE**

Charles E. McElderry, C/O Mack Welding Co. Inc., 9206 Grand Ave. Pl., Duluth, Minn.

Original application Dec. 4, 1968, Ser. No. 781,148, now Patent No. 3,572,410. Divided and this application Dec. 28, 1970, Ser. No. 101,591

Int. Cl. B65h *17/20*

U.S. Cl. 226—186 6 Claims



A support means, a tree delimber unit having articulated arcuate limb cutting blades for placement about a felled tree, a pair of tree-cutting blades in alignment with the articulated blades together with gripping rollers positioned on the support means intermediate of and in alignment with the articulated limb-cutting blades and the tree-cutting blades for gripping and moving a felled tree through said limb-cutting blades and to the tree-cutting blades.

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3,643,848

**GLASS GRIPPING DEVICES**

Harry Haller, Warley, England, assignor to Chance Brothers Limited, Warley, England

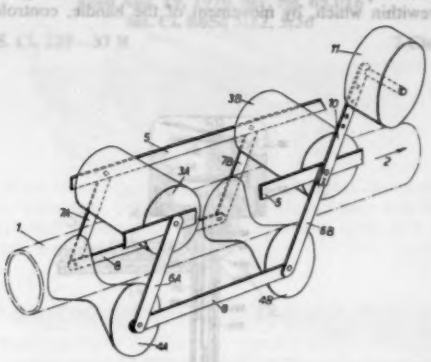
Filed Dec. 23, 1969, Ser. No. 887,582

Claims priority, application Great Britain, Jan. 2, 1969, 371/69

Int. Cl. B65h *11/22*

U.S. Cl. 226—186 2 Claims

A device for gripping a moving body of glass comprises two pairs of rollers supported for rotation about parallel axes and which engage between the rollers constituting each pair, opposite surfaces of the moving body of glass. The axes of the rollers are substantially perpendicular to the direction of glass movement and two tie members interconnect the ends



of the rollers of each pair, the tie members being pivotable about their axes which are parallel to the roller axes, and biassing means are provided to bias the members about the pivot axes so that the moving body of glass is gripped.

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3,643,849

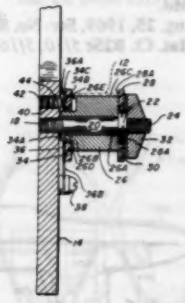
**TAPE GUIDE**

Clyde D. Roberts, Sapulpa, Okla., assignor to Midwestern Instruments, Inc., Tulsa, Okla.

Filed Feb. 25, 1970, Ser. No. 13,953

Int. Cl. B65h *23/32*

U.S. Cl. 226—199 4 Claims



This invention relates to a tape guide for guiding a magnetic tape and includes means of aligning the tape by applying slight continuous pressure to one edge so that the other edge contacts at all times a fixed edge member, the means for urging the tape including a movable edge member displaceable in a direction towards the fixed edge member and including resilient means urging the movable edge member towards the fixed edge member.

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3,643,850

**PIN-DRIVING TOOL**

Kumaji Endo; Fumio Ebisawa, and Masao Muratani, all of Yokohama-shi, Japan, assignors to Japan Drive-It Co., Ltd., Tokyo, Japan

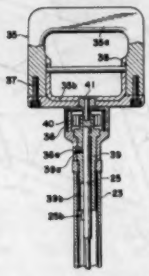
Filed Dec. 16, 1969, Ser. No. 885,528

Int. Cl. B25c *1/14*

U.S. Cl. 227—8 3 Claims

A pin-driving tool actuated by explosive forces is shown. The tool includes a housing having an explosive chamber

therewithin, pin support means operatively connected with said explosive chamber, and a cartridge selectively contained within said explosive chamber. A connecting cylinder is mounted upon the housing and contains an actuating lever therewithin which, by movement of the handle, controls a



control lever. The control lever in turn abuts a forwardly biased spring-loaded ram which, in turn is adapted to strike a firing pin. A safety hook is provided which prevents the control lever from moving if the probe to which it is connected projects from the tool and the tool is not in abutting relationship with work.

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**3,643,851**

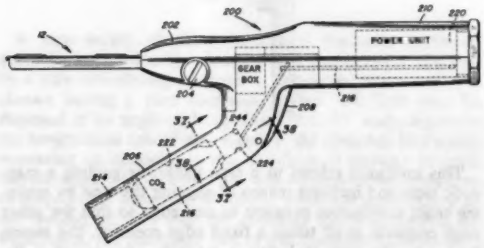
**SKIN STAPLER**

**David T. Green, Norwalk, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.**

**Filed Aug. 25, 1969, Ser. No. 852,822**

**Int. Cl. B25c** *5/10, 5/16*

**U.S. Cl. 227—19** **41 Claims**




A surgical instrument for applying sterilized staples from a disposable staple-carrying cartridge to the disunited skin of a patient in order to effect a joining of the skin. The instrument consists of an anvil adapted to lie flush with the skin, a disposable cartridge housing a plurality of staples which are to be folded around the anvil, and a pusher for bending the staples around the anvil. The pusher is U-shaped with chamfers on the arms thereof to effect the bending with a minimum of force. A gas-powered unit serves to eject and form the staples in a neat and uniform manner. A novel disposable gas cartridge is also disclosed.

**3,643,852**

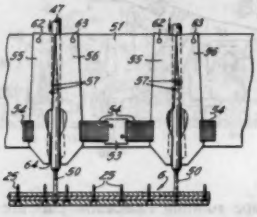
**NAIL CHUCK**

**Adam V. Kowalczyk, 84-33 Penelope Ave., Rego Park, N.Y.**

**Original application Jan. 11, 1965, Ser. No. 494,467, now Patent No. 3,514,467, dated May 26, 1970. Divided and this application May 7, 1970, Ser. No. 35,535**

**Int. Cl. B27f** *7/02*

**U.S. Cl. 227—149** **4 Claims**



Nail chuck comprising a pair of pivoted jaws forming a bore therebetween, the jaws pivoting about pivot points to permit a punch to drive a nail out of the chuck, the points being adjacent the upper ends of the jaws.

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**3,643,853**

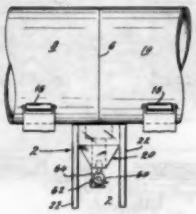
**FLUX BACKUP UNIT**

**James J. Hiller, Jennings, Mo., assignor to Valley Steel Products Company, St. Louis, Mo.**

**Filed Dec. 22, 1969, Ser. No. 886,857**

**Int. Cl. B23k** *1/00*

**U.S. Cl. 228—41** **9 Claims**



A flux backup unit applies a continuous flow of granular flux to the underside of a joint as a weld is made at that joint. The backup unit includes a hopper, an open top container within the hopper, and a feed screw for lifting the flux from the bottom of the hopper to the container. The continuous flow of flux into the container causes the container to remain full as the joint is moved relative to it so that the joint is continuously backed with flux. The excess flux introduced into the container overflows into the hopper and is thereby automatically recirculated through the container by the feed screw.

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**3,643,854**

**PAINT CONTAINER**

**Gordon W. Holmes, 1475 Larchview Trail, Port Credit, Ontario, Canada**

**Filed Aug. 26, 1969, Ser. No. 853,050**

**Int. Cl. B65d** *5/60*

**U.S. Cl. 229—14 B** **1 Claim**

A container for paints and like liquids comprises a carton erected from a collapsible tubular blank, a rectangular lid which is secured to the top of the carton, and a flexible bag

having an opening which is peripherally sealed to a skirt depending from the lid within the carton. The carton can be

stored in a flat condition prior to assembly, and the lid and bag assembly can also be stored in a flat condition.

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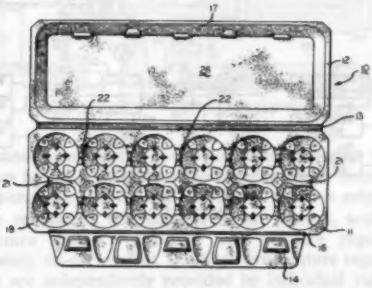
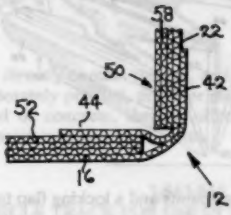
**3,643,855**
**MOULDED CONTAINER**
David Donaldson, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.
Filed Dec. 10, 1969, Ser. No. 883,896
Int. Cl. B65d *1/24, 1/36*
U.S. Cl. 229—2.5 3 Claims



A moulded container, particularly for the packaging of frangible articles, such as eggs. The container is characterized by a tray having a plurality of cup-shaped cells formed therein, each receiving one of a number of similar articles, which may vary in size and contour, but each having a transverse cross section which is essentially circular. Each of the cells has at least one planar surface therein resulting in a diametrical distance which is less than the normal diameter of said cell in a plane normal to the longitudinal axis of said cell. The thickness of the moulded material at such planar surface is less than the thickness of the material forming the cell, so that when the cell is loaded, and the article contacts the planar surface, the latter deflects the larger articles, and increases materially the amount of wedging of the article as it approaches the bottom of the cell. The deflection of the thinner planar surfaces of the cell thus absorbs energy and minimizes rebound of the egg. By reason of such deflection, a range of different sized articles may be accommodated successfully.

**3,643,856**
**BULK SHIPPING CONTAINER**
Chandler H. Jones, Memphis, Tenn., assignor to Owens-Illinois, Inc.
Filed Aug. 19, 1970, Ser. No. 65,016
Int. Cl. B65d *5/32, 5/56*
U.S. Cl. 229—37 R 7 Claims



A bulk shipping package including an outer container constructed of suitable sheet material, such as corrugated paperboard, from a flat blank properly slit and scored and set up in parallelepiped form usually with the final connector joint for the adjacent end extremities of the blank at one of the vertical connectors of the package, an insert sleeve of triple wall corrugated paperboard, and a unique connector joint which provides increased strength to prevent failure of the package.

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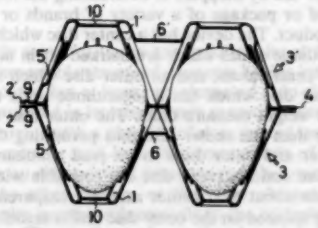
**3,643,857**
**PLASTIC EGG PACKAGE**
Hikoji Noguchi, No. 1251-10, Oaza-Narabashi, Yamato-cho, Kitatamo-gun, Tokyo-to, Japan
Filed Sept. 30, 1969, Ser. No. 862,324
Int. Cl. B65d *85/32*
U.S. Cl. 229—44 R 1 Claim



An egg package made of transparent synthetic resin including a bottom portion and a cover joined together at one side, both the bottom and cover containing carrier concavities for holding eggs, said concavities having lateral ribs therein for contacting the eggs and spaces between the flanges of the bottom and cover to permit circulation of air around the eggs.

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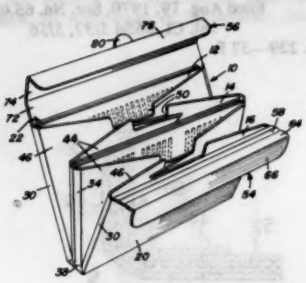
**3,643,858**
**FOLDING COMPARTMENTED FILE**
Jonas Deckys, 19155 66th Pl. N.E., Seattle, Wash.
Filed Mar. 11, 1970, Ser. No. 18,557
Int. Cl. B65d *27/08*
U.S. Cl. 229—72 10 Claims

A three compartment file folded from a single blank. The blank, and file folded therefrom, includes a plurality of

panels and flaps, along with foldlines and expanding folds. The assembled file incorporates an expanding closure flap to



overlie the three compartments and a locking flap to lock the closure flap closed.

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**3,643,859**

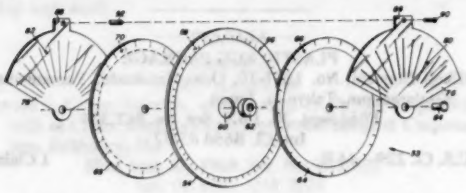
**SHOPPER CALCULATOR AND COMPARISON DEVICE**

**George R. Kreisel, Jr., 4719 Parkman Ct., Annandale, Va.**

**Filed Aug. 11, 1970, Ser. No. 62,801**

**Int. Cl. G06c 3/00**

**U.S. Cl. 235—88** **28 Claims**



This disclosure relates to a calculator and comparison device for use by shoppers in determining the most economical brand or package of a variety of brands or sizes of the same product. The device has a center disc which has a series of logarithmic scales which are marked-off in indicia of dollars and cents values, and an outer disc which is carried on the center disc which has a logarithmic scale measured in standard weight measure units. The outer disc is smaller in diameter than the center disc thus permitting the scales on the center and outer discs to be read simultaneously. The center disc and the outer disc are rotatable with respect to each other about their center axis. A transparent member is rotatably secured on the outer disc and is associated with the center and outer discs. The transparent member has a scale marked-off in indicia of units, cans, boxes, etc. The scale on the transparent member may be superimposed over the scales on the center and outer discs, thereby permitting the three scales to be read and used simultaneously. Some means to reduce friction is provided between the center and outer discs so that the outer disc and transparent member can be rotated together about the center axis of the disc without moving the center disc.

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**3,643,860**

**YARDAGE INDICATOR FOR HANDCART**

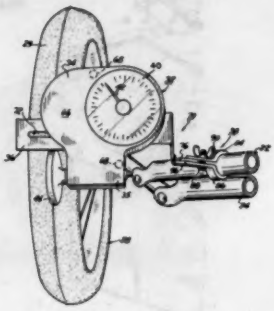
**Robert H. Murphy, Jr., 6242 Lake Forest, and William G. Goetz, 6346 Tanglewood, both of Grand Blanc, Mich.**

**Filed Mar. 21, 1969, Ser. No. 809,123**

**Int. Cl. G01c 22/00**

**U.S. Cl. 235—95** **2 Claims**

A yardage indicator to be mounted on a manually driven handcart, such as a golf cart, having a friction wheel adapted to ride on either wheel of the cart to drive a reduction gear mechanism as the cart wheel rotates, the output of which is connected to a pointer which rotates around a dial to accurately and visually indicate the yardage traveled by the cart. The pointer is frictionally connected to the gear mechanism



output shaft to permit a manual resetting of the pointer to any mark on the dial without affecting the gear mechanism. The indicator is provided with adjustable mounting means to compensate for different cart designs and different diameters and tracks of cart wheels.

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**3,643,861**

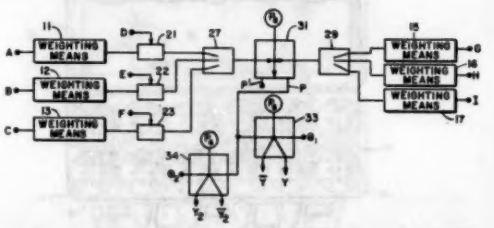
**FLUIDIC THRESHOLD GATE**

**Herbert M. Eckerlin, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Dec. 2, 1969, Ser. No. 881,537**

**Int. Cl. G06d 5/00**

**U.S. Cl. 235—201** **11 Claims**




A fluidic logic gate utilizing the principles of threshold logic. This type of fluidic gate, which realizes complex logical functions with fewer gates than conventional fluidic logic gates, consists basically of the following types of components: diverters or fluidic inverters which perform a selective inhibit function, passive summing junctions, a proportional fluid amplifier and a threshold biased bistable fluid amplifier.

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**3,643,862**

**AUTOMATIC DAMPER ON REGISTER FOR COMBINATION HEATING-COOLING SYSTEM**

**Charles H. Byrne, 540 Orange Ave., South San Francisco, Calif.**

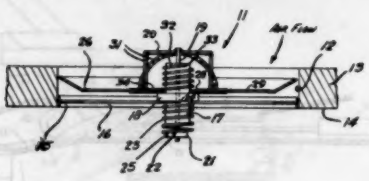
**Filed Jan. 23, 1970, Ser. No. 5,174**

**Int. Cl. G05d 23/02**

**U.S. Cl. 236—1** **10 Claims**

An airflow-controlling damper mechanism consisting of a fixed frame in which a damper flap frame is rotatably mounted. The flap frame has damper segments pivoted therein on radial axes. A drive shaft is journaled axially in the

fixed frame and has a drive gear meshing with gear segments carried by the damper segments. Respective thermoresponsive torsion springs connect the flap frame and the drive shaft through the fixed frame, one being responsive to the temperature of incoming air and the other being responsive to the temperature of room air, whereby to open or close the damper segments in accordance with the relative temperatures of the incoming air and the room air.



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**3,643,863**

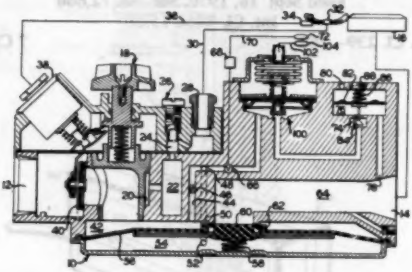
**COMBINATION CONTROL DEVICE HAVING A HYDRAULIC HIGH LIMIT VALVE ASSEMBLY**

**John W. Wright, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Feb. 13, 1970, Ser. No. 11,078**

**Int. Cl. G05d *16/16***

**U.S. Cl. 236—80** **13 Claims**



A combination control device for main and pilot burner apparatus having a differential pressure operated diaphragm valve operated by an internal bleed line which is subject to pressure regulation, thermostatic on-off control, and high-temperature shutoff regulation. The pressure regulation, thermostatic on-off control, and high-temperature regulation features are independently provided by individual valve assemblies so as to increase the overall fail-safe characteristics of the combined device, the high-temperature valve assembly including a hydraulic snap acting mechanism actuated by a closed hydraulic system charged with a gas vapor having a vapor pressure which is less than atmospheric pressure for enabling rapid fuel flow cutoff upon the occurrence of a preselected excessive ambient temperature and for assuring fuel cutoff in the event of a rupture of the hydraulic system.

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**3,643,864**

**RAILROAD GRADE CROSSING**

**Hans Ziegler, Schurtannenstrasse 21, 9400 Rorschach, Switzerland**

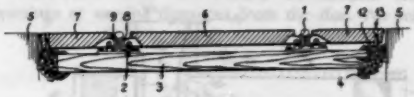
**Filed Nov. 18, 1969, Ser. No. 877,607**

**Claims priority, application Switzerland, Nov. 19, 1968, 17246/68**

**Int. Cl. E01b *2/00***

**U.S. Cl. 238—8** **9 Claims**

A novel railroad grade crossing is disclosed comprising elongated support members secured to each side of each rail and substantially complementing the rail profile. Resting upon the support members and secured thereto, are filler plate members which extend between the two rails and outwardly from either rail. Inasmuch as the filler plate members do not directly contact the rail, and therefore do not need to be elaborately profiled, the filler plate members may be constructed of concrete, thereby effecting a great cost saving over known cast-iron filler plates.



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**3,643,865**

**VEHICLE TRACK FOR USE IN TOY BUILDING KITS**

**Wolfgang Mutz, Dornstetten; Theodor Killgus, Freudenstadt, and Artur Fischer, Altheimer Str. 219 D-7241, Tumlingen, all of Germany, assignors to said Fischer, by said Mutz and Killgus**

**Filed May 14, 1970, Ser. No. 37,090**

**Claims priority, application Germany, May 19, 1969, P 19 25 377.1**

**Int. Cl. A63h *19/30***

**U.S. Cl. 238—10 F** **16 Claims**

A vehicle track for use in toy building kits of the type including connectable structural elements having interengageable connectors, has at least one elongated strip-shaped track member provided in its transversely spaced longitudinally extending margins with a plurality of slots spaced lengthwise of the track member and extending transversely of the latter. The slots may either extend from one margin towards but not quite to the other margin, or they may alternately extend from opposite margins substantially to the midpoint between the margins. The track member is thereby subdivided into a plurality of connected sections which may be angularly displaced relative to one another if the track member is bent in its plane for imparting to the track member a straight or a curved configuration as desired. Connecting means provided on the sections of the track member is interengageable with the connectors of the structural elements.

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**3,643,866**

**REVERBERATING LIQUID DISCHARGE DEVICE**

**John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corp., Burbank, Calif.**

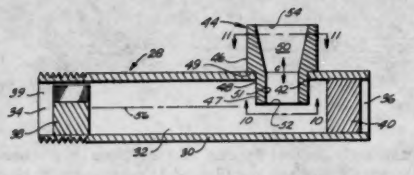
**Continuation-in-part of application Ser. No. 686,410, Nov. 29, 1967, now Patent No. 3,547,351, dated Dec. 5, 1970. This application June 15, 1970, Ser. No. 46,400**

**Int. Cl. B05b *1/08***

**U.S. Cl. 239—101** **3 Claims**

A liquid discharge device having no moving parts which inherently reverberates and pulsates liquid being discharged

therefrom, is especially adapted to provide unusually precise control over the degree and extent of the reverberation and



pulsation as well as over the nature and extent of the discharge pattern.

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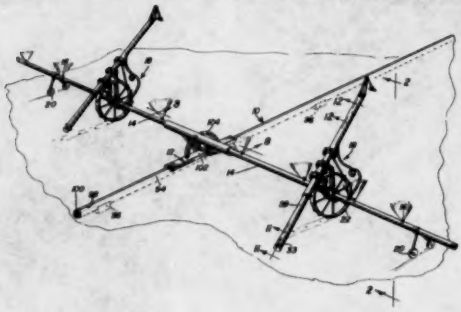
**3,643,867**
**SELF-PROPELLED IRRIGATION SYSTEM**
**Rudolph N. Thietje, 1744 S. Dayton Pl., Kennewick, Wash.**
**Filed Nov. 14, 1969, Ser. No. 876,903**
**Int. Cl. B05b 3/18**
**U.S. Cl. 239—183** **11 Claims**



A supply conduit is positioned across a field to be irrigated. The conduit has a slit formed along its length and a displaceable seal is located in sealing relation with the slit. A water commutator rides along the conduit and has riders connected thereto which depress that portion of the seal upon which the commutator is riding thereby allowing waterflow from the conduit to the commutator. Sprinkler supply pipes communicating with the commutator mount means for driving the sprinkler supply pipe and the commutator along the length of the supply conduit. The drive means comprises wheels powered by pressured water in the sprinkler supply pipes.

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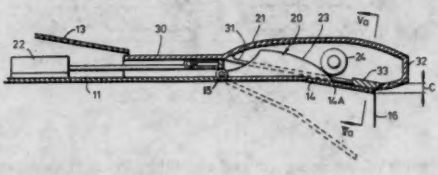
**3,643,868**
**JET NOZZLE**
**David Roberts McMurtry, Bristol, England, assignor to Rolls-Royce Limited, Derby, England**
**Filed June 11, 1970, Ser. No. 45,526**
**Claims priority, application Great Britain, Sept. 6, 1969, 30,997/69**
**Int. Cl. B64c 15/06**
**U.S. Cl. 239—265.39** **4 Claims**

The disclosure of this invention pertains to a jet nozzle for a gas turbine engine wherein the throat diameter of the nozzle is defined by the downstream end of an annular arrangement of flaps connected to a jet pipe and pivoted by a shroud surrounding the flaps being moved axially along the jet pipe. Between the shroud and each of the flaps there is provided a cam and roller device to convert the movement of the shroud into that of the flaps. The shroud comprises walls extending at a boat tail angle and in relatively close proximity to the



flaps, from the position of maximum throat diameter to a larger diameter upstream thereof, each wall extending between two adjacent said cam and roller devices, and each of these devices is housed by a strake connected to the adjacent walls. The arrangement of the walls and the strakes ensures low-base drag.

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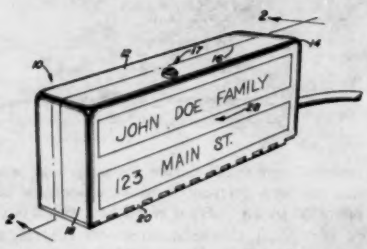
**3,643,869**
**CONVERTIBLE LAWN SPRINKLER**
**Marvin E. Lightfoot, Pacific Marina-Caravel Apt. #204, Alameda, Calif.**
**Filed Sept. 16, 1970, Ser. No. 72,660**
**Int. Cl. B05b 15/00**
**U.S. Cl. 239—289** **7 Claims**




A sprinkler head of modern design is enclosed within a closed split housing that includes oppositely disposed wall sections connected to a base. Snap action springs selectively cause the outward rotation of the wall sections so that the wall sections become inverted and forcefully raise the base up off the ground. This elevates the sprinkler head above the ground and increases the irrigation efficiency thereof. A wall section of the housing carries indicia thereon indicating the name and location of a residence. With a closed housing placed on a lawn ground surface, the indicia becomes visible.

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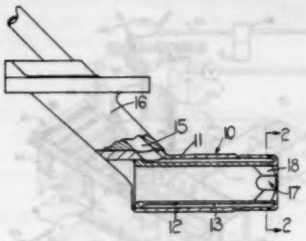
**3,643,870**
**LIQUID-ATOMIZING DEVICES**
**Ronald D. H. Saunders, Clitheroe, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**
**Filed May 12, 1970, Ser. No. 36,649**
**Int. Cl. B05b 7/10**
**U.S. Cl. 239—403** **1 Claim**

A liquid-fuel-atomizing device comprises a tubular body open at both ends and having inclined blades mounted within

one end to impart a swirling motion to air passing through the body. Fuel is supplied through nozzles which are directed




towards the faces of the blades which are, in use, at the higher pressure.

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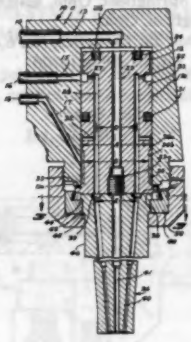
**3,643,871**

## TORCH APPARATUS

**Edward L. Hamernik, and Frank T. Kawamoto, both of Minneapolis, Minn., assignors to Tescom Corporation, Minneapolis, Minn.**

**Filed Jan. 30, 1970, Ser. No. 7,173**
**Int. Cl. F23d *11/16***
**U.S. Cl. 239—419.3** **7 Claims**



Torch apparatus that includes a torch head having a torch bore, a mixer in the torch bore, a torch tip, a collar on the torch tip and a head nut threaded on the torch head to, through the collar, retain the seating surface of the torch tip against the seating surface of the mixer. A mixer cutting oxygen passageway at each end respectively opens to a corresponding passageway in the torch head and the torch tip. Torch head preheat oxygen and fuel gas passageways open to oxygen-fuel gas passageways in the mixer which in turn opens to an annular groove in the torch tip, the torch tip oxygen-fuel gas passageways opening to the groove. The tip seating surface is recessed from the flanged edge of the collar.

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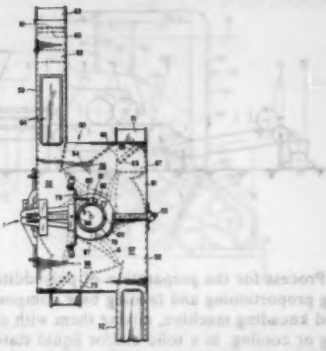
**3,643,872**

## DEVICE FOR SPREADING GRANULAR OR POWDERY MATERIAL

**Elwood Lee Smith, Elm City, N.C., assignor to The Lely Corporation, Wilson, N.C.**

**Filed Oct. 20, 1969, Ser. No. 867,733**
**Int. Cl. A01c *15/04***
**U.S. Cl. 239—655** **19 Claims**

A spreading device including a hopper, a rotatable spreader disc and a hood beneath the hopper, the hood surrounding the disc. Within the hood, turnable feed or distributor rings with outlet ports are positioned between the spreader and the hopper. The hood has a plurality of ejection openings arranged around the disc to receive granular or powdery material which is first passed through the ports in the distributor rings and then propelled by the disc. Outlets in distributor arms are located downstream from the openings at varying distances from the disc. Air inlets are



provided in the hood adjacent the spreader disc so that air can be drawn in and expelled by the rotating disc, carrying the granular or powdery material being spread. An internal web of guide segments within the hood divide the openings from one another and assist to dispense even amounts of material received from the hopper. Baffles are located near the outlets to guide ejected material towards the ground.

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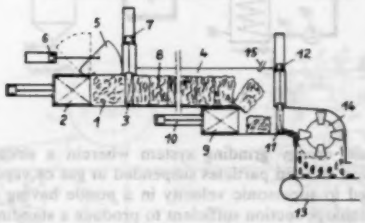
**3,643,873**

## PROCESS FOR FRAGMENTING SCRAP METAL

**Robert George, Liege, Belgium, assignor to George & Cie S.P.R.L., Liege, Belgium**

**Filed May 27, 1969, Ser. No. 828,283**
**Claims priority, application Belgium, July 25, 1968, 41957**
**Int. Cl. B02c *19/12***
**U.S. Cl. 241—3** **5 Claims**



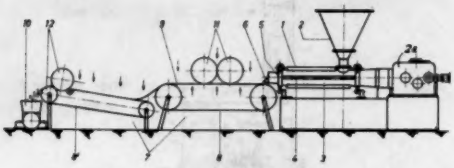

A process for fragmenting scrap metal comprises precompressing the scrap metal into blocks having numerous interstices therein, flowing liquid nitrogen at a temperature between $-a°$ and $-120°$ C. through the interstices to cool and embrittle the blocks, and then compressing the cooled and embrittled blocks to fragment them into pieces of scrap metal. If desired, the fragmented scrap metal may then be seperated according to its size or composition. The process is particularly suitable for fragmenting automobile wrecks and if the scrap separated contains iron and iron alloys, the separating step may be magnetically performed.

3,643,874

## PROCESS FOR THE PREPARATION OF INTERMEDIATES OF POLYADDITION RESINS

Peter Franz, Mumpf, and Andreas Maier, Pratteln, both of Switzerland, assignors to Buss A.G., Basel, Switzerland

Filed Sept. 9, 1969, Ser. No. 856,336
Claims priority, application Switzerland, Sept. 13, 1968, 14003/68
Int. Cl. B02c 21/00
U.S. Cl. 241—3 5 Claims



Process for the preparation of polyaddition resins, including proportioning and feeding base compositions in a mixing and kneading machine, mixing them with simultaneous heating or cooling, in a solid and/or liquid state, plasticizing and homogenizing the compositions, expelling the resin mix through a heated die onto a cooling belt, solidifying and preforming the resin mix into loosely connected small pieces, and breaking up as well as grinding the preformed pieces of the resin mix. Optionally crushing may be performed before the breaking and grinding step.

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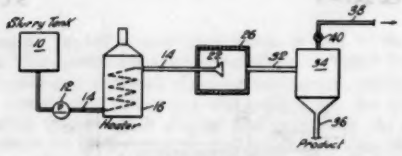
3,643,875

## FLUID ENERGY GRINDING METHOD AND SYSTEM

Roger M. Dille, La Habra, and Warren G. Schlinger, Pasadena, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed June 27, 1969, Ser. No. 837,065
Int. Cl. B02c 19/06
U.S. Cl. 241—5 7 Claims




A fluid energy grinding system wherein a stream of a dispersion of solid particles suspended in gas or vapor is accelerated to supersonic velocity in a nozzle having a divergent discharge section sufficient to produce a standing shock wave along the path of flow of solid particles effecting size reduction of particles.

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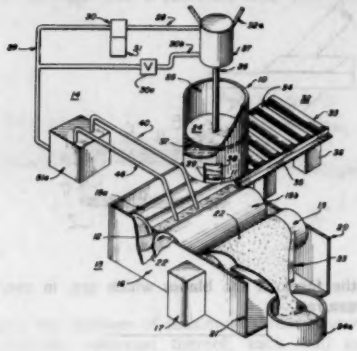
3,643,876

## AUTOMATIC APPARATUS FOR SUPPLYING LIQUIDS TO ROLLER-MILLS

Leslie F. Stone, Westchester, Ill., assignor to The Richardson Company, Melrose Park, Ill.

Filed Dec. 11, 1969, Ser. No. 884,057
Int. Cl. B02c 4/28
U.S. Cl. 241—34 5 Claims

An apparatus for automatically controlling the liquid level of a roller mill feed-pool embodying a pressurized vessel containing the liquid to be milled under uniform pressure and control means for regulating the pressure on the liquid to deliver the liquid to the feed-pool as required.



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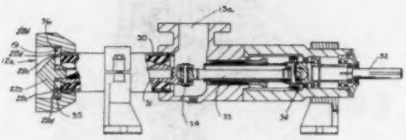
3,643,877

## PUMP WITH MACERATOR

George H. Zimmer, Springfield, Ohio, assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed Jan. 28, 1970, Ser. No. 6,445
Int. Cl. B02c 18/06
U.S. Cl. 241—46.02 3 Claims



A pump of the progressing cavity type having a direct driven shredding or macerating unit combined therewith for the purpose of shredding or comminuting raw sewage or other large suspended bodies and pumping the fluids with the suspended solids therein to a holding tank and the like, as for example in recreational units such as trailers, campers, boats, and the like. A cutter element is secured to the rotor shaft at the pump intake, and coacts with a stationary cutter element surrounding the cutter intake to reduce the large and suspended solids to a state in which, while suspended in a fluid, they may be pumped.

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3,643,878

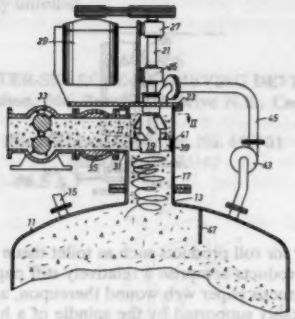
## DEVICE FOR FEEDING DENSE CELLULOSIC PULP INTO A CLOSED CONTAINER

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Mar. 18, 1970, Ser. No. 20,760
Claims priority, application Sweden, Apr. 3, 1969, 4834/69
Int. Cl. B07b 9/00
U.S. Cl. 241—48 3 Claims

A means for fluffing cellulosic pulp that should be treated in a gaseous environment, e.g., bleached with a gaseous bleaching agent, consists of a rotary breaker inserted in an inlet chamber at the top of the container in which the treat-

ment takes place. The breaker comprises a hub carried by a vertical shaft and a number of inclined vanes distributed over the cylindrical face of said hub and having serrated edges



working upon a plug of pulp continuously fed into said inlet chamber through a horizontal conduit having its orifice opposite the breaker.

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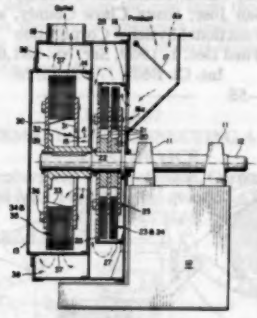
**3,643,879**

**TWO-STAGE HAMMER MILL**

**Leslie Palyi, Don Mills, Ontario, Canada, assignor to Nicholas Pora**

**Filed July 10, 1969, Ser. No. 840,691**
**Claims priority, application Great Britain, July 17, 1968, 34,052/68**
**Int. Cl. B02c *13/04***
**U.S. Cl. 241—55** **10 Claims**



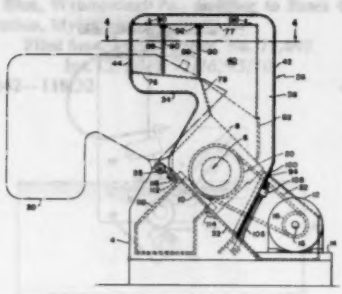
A two-stage rotary hammer mill having first and second rotary hammer mill stages mounted on a common drive shaft and driven together in unison, the first stage producing a semiground product, and the second stage receiving the semiground product and producing a finely ground product, in which the second stage incorporates blower means drawing air through the system and thereby ensuring free flow of product therethrough, the two stages being arranged in a common housing, and product released from the screen of the first stage being collected in a generally annular space and directed into a conduit and delivered to the second stage around the central axis thereof.

**3,643,880**

**MATERIAL CUTTING MACHINE AND SOUND-ABSORBING HOOD THEREFOR**

**Russell I. Peterson, Jr., Seekonk, Mass., assignor to Cumberland Engineering Company Inc., Pawtucket, R.I.**

**Filed Aug. 12, 1970, Ser. No. 63,066**
**Int. Cl. B02c *23/00, 18/00***
**U.S. Cl. 241—100** **12 Claims**



The invention is a machine for comminuting material in which a rotary cutting mechanism is used. A hood is mounted on the machine adjacent the inlet passage thereto, the function of the hood being to minimize the noise caused by the machine when it cuts material. Throughout the machine, additional sound-absorbing means are used at strategic locations to eliminate or minimize the passage of sound from the inside of the total enclosure of the machine to the outside thereof.

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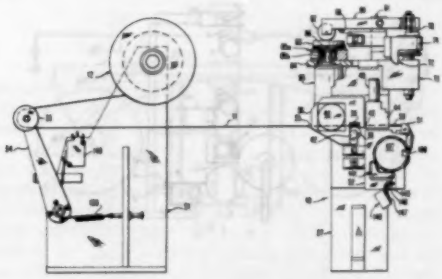
**3,643,881**

**APPARATUS FOR WINDING A CORE AND SPLITTING MULTISTRAND WIRES**

**Karl W. Beumer, Poughkeepsie; Gerard M. Geany, Somers; John A. Haran, Peekskill; Edward P. Hecker; George E. Nyman, and Robert E. Post, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed July 17, 1968, Ser. No. 745,459**
**Int. Cl. H01f *41/08***
**U.S. Cl. 242—4 B** **17 Claims**



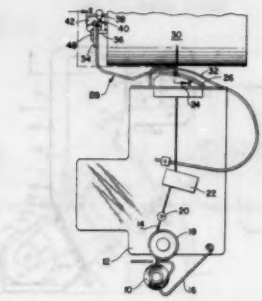
A flat multistrand wire is tightly wrapped around a core through utilization of a shuttle having a passage within which the multistrand wire is disposed during winding. The apparatus includes a device for separating each end of the strands of the wire after the wire has been tightly wrapped around the core.

3,643,882

## YARN HANDLING

Donald W. Grant, Warwick, R.I., assignor to Lessona Corporation, Warwick, R.I.

Filed Mar. 9, 1970, Ser. No. 17,790
Int. Cl. B65h 63/00
U.S. Cl. 242—36 5 Claims



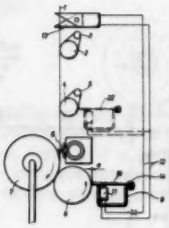
A breakage lever assembly and assembly control for a winder has an electromagnet connected in circuit with an electronic yarn clearer for withdrawing the breakage lever from contact with an advancing strand of yarn when the clearer detects that the yarn is advancing normally. When the clearer detects that the yarn is not advancing normally, the breakage lever is released for movement to a position in the normal yarn path and thereupon performs all of its normal functions in conjunction with the winder control, such as commencement of a knotting cycle to piece up a broken yarn, initiating a second knotting cycle in the event of a mistie and other functions as are well understood in the art.

3,643,883

## LAP-DETECTING STOP MOTION

Olivier Wuest, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Aug. 4, 1969, Ser. No. 847,335
Claims priority, application Switzerland, Aug. 8, 1968, 12119/68
Int. Cl. B65h 63/00
U.S. Cl. 242—36 12 Claims



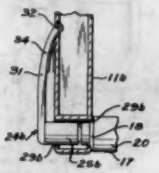
There is disclosed a lap-detecting stop motion for thread transporting rolls of draw-winding, drawtwisting or takeup machines for processing endless filaments. Such stop motion comprises a feeler set closely to the roll surface, the feeler in its rest or idle position being arranged substantially in a plane containing the roll axis, wherein the feeler portion nearest to the roll can be deflected in the direction of the roll circumference.

3,643,884

## SPINDLE RELEASE HOLDER FOR ROLL PRODUCTS

Frank M. Curtin, 3747-9 Vista Compana, Oceanside, Calif.

Filed June 8, 1970, Ser. No. 44,100
Int. Cl. A47k 10/22, 10/32
U.S. Cl. 242—55.2 3 Claims



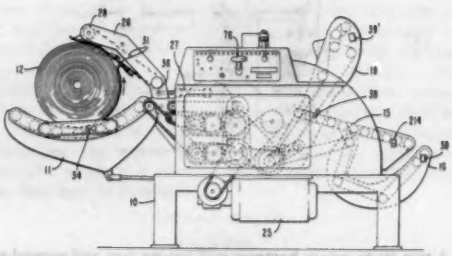
A holder for roll products such as toilet tissue and the like. Such roll products comprise a relatively stiff paper core having a continuous paper web wound thereupon, and the entire roll is rotatably supported by the spindle of a holder so that desired lengths of the web can be withdrawn and separated from the roll. The holder includes a pair of supports provided with axially spaced journal recesses that rotatably support an elongated spindle having bearing journals at the ends thereof which seat within such recesses. The spindle is equipped with spring means biasing the bearing journals away from each other so that they seat firmly within the bearing recesses, and means are provided for releasing the spindle from the supports therefor while the depleted core of such roll remains upon the spindle. The spindle release mechanism includes a reciprocable plunger movable into engagement with one of the bearing journals so as to displace the same from the bearing recess therefor, thereby enabling the core-equipped spindle to be removed from the supports.

3,643,885

## CARPET SUPPLY CRADLE AND FEEDER MECHANISM FOR A CARPET MEASURING AND CUTTING MACHINE

Karl K. Keesling, Los Altos, Santa Clara County; Thomas B. Keesling, Los Gatos, Santa Clara County, and Clifford E. Keesling, San Jose; Santa Clara County, all of Calif., assignors to Functional Systems Corporation

Filed Dec. 1, 1969, Ser. No. 881,034
Int. Cl. B65h 17/12, 25/26
U.S. Cl. 242—55 2 Claims



A cradle for supporting and rotating a supply roll of carpeting on a carpet measuring and cutting machine, the cradle drive being reversible to at times wind up the supply roll and at other times to drive the carpet in feed-out direction onto the lead bed of the machine. A cradle trigger is located in the cradle for sensing the free edge of the rug during rotation and operating upon sensing the free edge on the first revolution of the carpet after receipt of a "carpet advance" signal to terminate reverse rotation and initiate forward rotation to

unwind the carpet onto the lead bed. Feeder drive belts contact the supply roll and are driven in a direction urging the free edge of the carpet away from the supply roll and onto the lead bed. The feeder belt is subsequently reversed in direction and serves to uncurl and flatten out the trailing edge of the carpet supply roll onto the lead bed when the carpet is fully unrolled.

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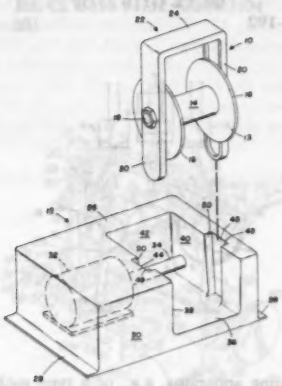
**3,643,886**

**WATER-SKI-ROPE-RETRIEVING DEVICE**

**Eldon L. Colton, 366 Brentwood Drive N.E., Cedar Rapids, Iowa**

**Filed Sept. 4, 1970, Ser. No. 69,701**
**Int. Cl. B65h *75/40***
**U.S. Cl. 242—86.5 A** **10 Claims**



A water-ski tow-rope-retrieving device in which the tow rope is retrieved by winding it around a reel. The reel is not connected to the drive mechanism, but rather is driven by frictional engagement with a rotating shaft or drum. When the rope is to be let out, the reel is disengaged from the drum. The reel is mounted on an operating handle which is used to engage and disengage the reel from the drum and to lift the reel from the device whenever desired. Therefore, a single drive unit can be used with several reels on the same boat for retrieving several tow ropes.

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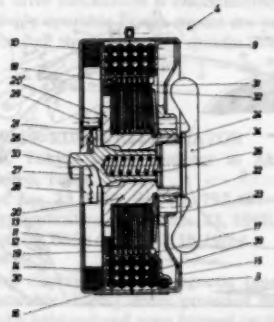
**3,643,887**

**PULLING ASSEMBLY FOR CONNECTING A LOAD TO A PULLING DEVICE**

**Hans Kuhl, Kornbergweg 12, Plochingen, Germany**

**Filed May 14, 1969, Ser. No. 824,632**
**Int. Cl. B65h *75/48***
**U.S. Cl. 242—107.3** **14 Claims**



A pulling assembly where a rotary unit is acted upon by a tension-transmitting structure, such as a cable, in such a way as to tend to rotate this rotary unit in response to a pulling force which acts on the cable or other tension transmitting structure. A brake assembly coacts with the rotary unit to resist rotation thereof. Therefore, when the rotary unit is turned the force transmitted thereto will be converted into heat by the braking action.

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**3,643,888**

**BOBBIN SLEEVE FOR WINDING OF TEXTILE FIBERS**

**Louis D. Blue, Wyomissing, Pa., assignor to Essex Chemical Corporation, Myerstown, Pa.**

**Filed Sept. 11, 1970, Ser. No. 71,497**
**Int. Cl. B65h *75/26, 75/10***
**U.S. Cl. 242—118.32** **4 Claims**

This invention relates to a bobbin sleeve upon which textile fibers, such as those made of glass, can be wound. The sleeve is made of a thermoplastic polymer, such as polypropylene, and is characterized by protrusions formed into the wall of the tube to minimize sliding of the fiber package.

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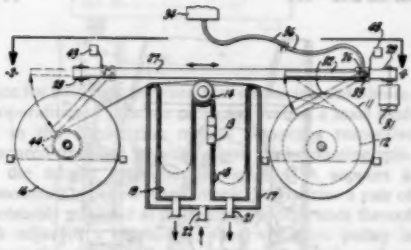
**3,643,889**

**AUTOMATIC TAPE-THREADING SYSTEM AND APPARATUS**

**Konrad A. Krause, 870 East El Camino Real, Mountain View, Calif.**

**Filed July 22, 1969, Ser. No. 843,452**
**Int. Cl. G11b *15/58, 15/66***
**U.S. Cl. 242—182** **12 Claims**



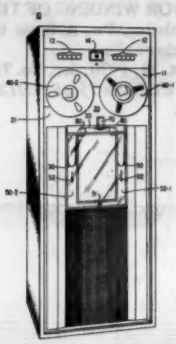
A threading system and apparatus for automatically threading flexible tape such as magnetic recording tape through a tape device by a travelling carriage physically gripping a free tape end at a supply location and moving it along a tape traverse path for release at a takeup position. The tape requires no end connector and the free tape end is automatically located and gripped without prepositioning.

3,643,890

## APPARATUS FOR THE AUTOMATIC THREADING OF A FLEXIBLE MEDIUM

Lee J. Milligan, Fairfield, and Douglas M. Mayer, Wayne, both of N.J., assignors to Certex, Inc., Fairfield, N.J.

Filed Nov. 18, 1969, Ser. No. 877,652
Int. Cl. G11b *15/58, 23/12*
U.S. Cl. 242—182 10 Claims



A unit for transporting a flexible record-keeping member, such as magnetic tape, with respect to a transducer, such as a read-write head, in which the medium is automatically threaded over a circuitous path from a supply member to a takeup member.

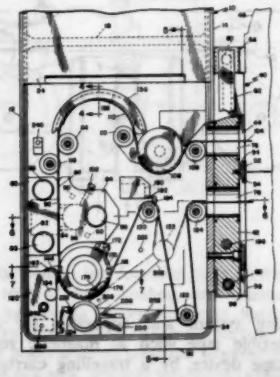
Automatic threading is accomplished despite the circuitry of the tape path by the retracting of the read-write head and using a jet of fluid, such as air, to directly carry the lead end of the tape from a supply reel to a takeup reel. The jet of air emanates from a rectangular aperture to prevent spiraling of the tape as it approaches the takeup reel. The latter includes a vacuum hub that seizes the tape and applies continuous suction during the threading operation. The tape is subsequently directed into its final position, and the read-write head repositioned for "reading" the tape and "writing" on it.

3,643,891

## FILM TRANSPORT UNIT

Willard D. Isbell, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Nov. 19, 1970, Ser. No. 90,982
Int. Cl. B65h *59/38*; G03b *1/04*; G11b *15/32*
U.S. Cl. 242—189 14 Claims



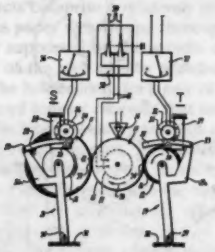
A film transport unit for use as a microfilm camera, or the like, and having quick release means for attachment of a variety of standard film magazines. Film is drawn from the supply magazine and a supply loop is maintained by a drive which grips only the edges of the film, and is advanced incrementally through an exposure gate by an edge gripping capstan driven by a stepping motor. The film loading path is very simple and the guiding elements incorporate means for maintaining constantly precise film advance over long periods of use, without damaging stresses or wear on the film.

3,643,892

## RIBBON-FEEDING SYSTEM

Charles A. Vogel, Sunnyvale, and John A. Cuvelier, Mountain View, both of Calif., assignors to Newell Industries Inc., Sunnyvale, Calif.

Filed Aug. 27, 1969, Ser. No. 853,428
Int. Cl. G11b *15/32*
U.S. Cl. 242—192 5 Claims



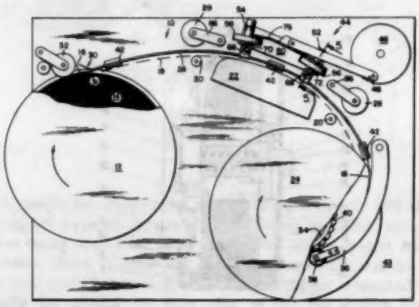
Ribbon-feeding apparatus, e.g., of a type such as a magnetic tape transport, employs a tape drive capstan riding in contact with supply and takeup rolls while the rolls are urged against the capstan. The capstan carries a tire which forms a resilient drive surface to define a ribbon-feeding nip. The drive surface of the capstan is encircled by laterally spaced-apart grooves of a depth and width which drive the rolls at a slower speed than the speed of the driving surface of the capstan in response to application of the compressive forces, i.e., so that the rolls progress "negatively" relative to the direction of rotation of the capstan.

3,643,893

## WEB-THREADING APPARATUS

Joseph J. Neff, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 4, 1969, Ser. No. 847,032
Int. Cl. G03b *1/04*; G11b *15/32*
U.S. Cl. 242—195 9 Claims



Automatic web threading apparatus providing an unobstructed and continuous temporary threading path between

web supply and takeup stations. A threading track having integral stripper means is normally positioned completely out of the web transport path, and during threading operation the track is caused to move to a position for receiving the web, or a "relatively stiff" leader attached thereto, when supplied by the supply station and for guiding the supplied web or leader to the takeup station.

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**3,643,894**

**FILM MOVEMENT DIRECTION SWITCHING DEVICE FOR SMALL MOVIE PROJECTORS**

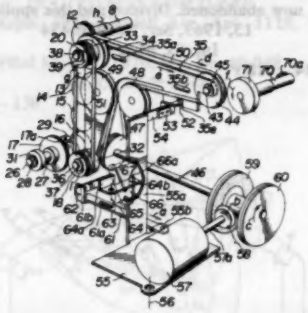
**Tatsusuke Kadowaki, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Sept. 21, 1970, Ser. No. 73,726**

**Claims priority, application Japan, Sept. 29, 1969, 44/77973**

**Int. Cl. B11b *15/32*; G03b *1/04***

**U.S. Cl. 242—201** **10 Claims**



A film movement direction switching device, for small movie projectors, includes an externally accessible control knob for switching the direction of rotation of the main shaft of the projector between a normal film feed forward direction and a film rewind reverse direction, as well as to disconnect the main shaft from a driving motor. A spindle driving mechanism is coupled to the main shaft and is automatically drivingly engaged with the takeup reel spindle upon rotation of the main shaft in a normal direction, with the supply reel spindle being idly rotatable, and is automatically drivingly connected to the supply reel driving spindle when the main shaft is rotated in the reverse direction, with the takeup reel spindle rotating idly. In the neutral position of the control, the drive mechanism is disconnected from both spindles. Selectively operable clutch means are provided additionally for rotating the supply reel spindle in the film rewind direction.

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**3,643,895**

**TAPE-RUNNING INDICATOR**

**Katsuya Atsumi, Tokyo, Japan, assignor to Akai Electric Company Limited, Tokyo, Japan**

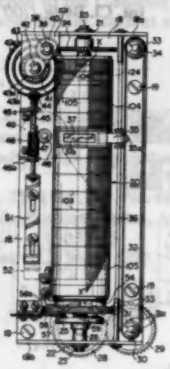
**Filed Jan. 23, 1969, Ser. No. 793,497**

**Claims priority, application Japan, Jan. 23, 1968, 43/4267**

**Int. Cl. B65h *61/00*; G11b *19/28***

**U.S. Cl. 242—201** **3 Claims**

A tape-running display unit for magnetic tape recorder, comprising a rotatable display drum provided with a dark-colored zone and a light-colored zone formed on the cylindrical surface of said drum the zones being defined by a helix and a generatrix, a slitlike window opening for viewing the movement of a part of said helix when said tape and said drum are moved in phase with each other; a selector runner adapted for showing a selected length of travel of said tape; an electrical switch arranged to be controlled by said selector



when the tape has travelled the selected length and to control in turn the operation of the tape-reeling mechanism of the tape recorder.

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**3,643,896**

**DEVICE FOR SWITCHING BETWEEN FILM ADVANCE AND FILM REWIND IN MOVIE PROJECTORS**

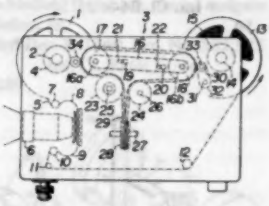
**Tatsusuke Kadowaki, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Sept. 10, 1970, Ser. No. 70,696**

**Claims priority, application Japan, Sept. 20, 1969, 44/74351**

**Int. Cl. B11b *15/32*; G03b *1/04***

**U.S. Cl. 242—205** **8 Claims**



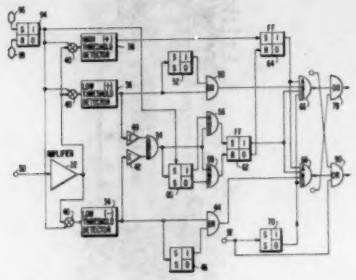
A device for switching between film-advancing and film-rewinding operations of a movie projector, having a main shaft included in the film-driving means, comprises respective wheels secured to rotate with the supply reel-mounting spindle and the takeup reel-mounting spindle. A support is slidably mounted between these wheels, and carries a pair of pulleys rotatably mounted at respective opposite ends thereof and each adjacent a respective wheel. A drive pulley is mounted on the main shaft for rotation therewith, and an endless belt is trained around the drive pulley and the two pulleys on the support. The direction of tension in the belt changes in accordance with the direction of rotation of the main shaft, to shift the support in the direction of the tension to effect driving of a respective spindle wheel by the belt through rotation of the adjacent pulley. A reversing wheel is rotatably mounted between one spindle wheel and its associated pulley. Either the takeup reel or the supply reel is selected automatically for driving in response to the direction of rotation of the main shaft.

**3,643,897**

## NUTATION CORRECTION SYSTEM FOR SPIN-STABILIZED SATELLITE

**George B. Johnson, Jr., Santa Clara, Calif., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Oct. 18, 1968, Ser. No. 768,631**
**Int. Cl. B64g *1/00***
**U.S. Cl. 244—1** **5 Claims**



A nutation control system for spin-stabilized satellites in which correction thrusters are cyclically fired by timed pulses generated in response to accelerometer signals. Correction is initiated when the accelerometer output exceeds a high-threshold level and continues until it is reduced below a low-threshold level. The termination point is detected by sampling the slope of the accelerometer signal during a window period in each half-cycle.

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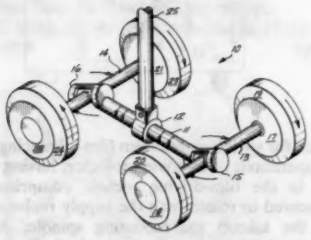
**3,643,898**

## METHODS AND MECHANISMS FOR STEERING TRUCK WHEEL AXLES BY A ROTATABLE TRUCK BEAM

**Philip C. Whitener, and Robert M. Weigel, both of Seattle, Wash., assignors to The United States of America as represented by the Administrator of the Federal Aviation Administration**

**Filed Dec. 17, 1969, Ser. No. 885,772**
**Int. Cl. B64c *25/50***
**U.S. Cl. 244—50** **26 Claims**



Methods for steering a truck of wheels, particularly for a heavy vehicle, such as but not limited to aircraft, and mechanisms for carrying out the methods are disclosed comprising two fore-and-aft steerable axles on a truck beam and a truck beam actuator, the steerable axles being pivotally mounted on canted and eccentric ends on the truck beam and responsive to the truck beam actuator or rotation of the truck beam for being rotatable in a horizontal plane so that scrubbing of the tires is prevented and turning forces to steer the landing gear truck are substantially reduced.

Likewise, varying of the canting of the wheel axles' pivotal axes provides turning of all wheel axles about a common center of turning for prevention of skidding of the tires during turns on the ground.

Further, rotation of the truck beam about a tilted axis provides increasing of the steering angle of the truck wheel axles without increasing the truck size.

In addition, retraction of the truck of wheels into a smaller and shallower wheel well results from the eccentricity of the fore-and-aft axle bearings.

Dual usage of the truck beam rotating actuators results in both steering of the fore-and-aft truck wheel axles and for rotating the truck prior to retraction.

Likewise, single axle steering is obtained with a rotatable fore-and-aft extending eccentric shaft.

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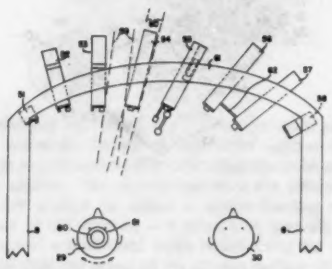
**3,643,899**

## AIRPLANE WITH SPATIAL PANORAMA

**Floyd A. Firestone, 172 Clinton Ave., Dobbs Ferry, N.Y.**

**Original application Mar. 7, 1969, Ser. No. 806,346, now Patent No. 3,572,615, which is a continuation-in-part of application Ser. No. 660,700, Aug. 15, 1967, now abandoned , Continuation-in-part of application Ser. No. 616,056, Feb. 14, 1967, now abandoned. Divided and this application Nov. 13, 1969, Ser. No. 876,434**
**Int. Cl. B64c *1/00***
**U.S. Cl. 244—118 P** **16 Claims**



A fixed wing airplane having a substantially transparent fuselage, which in straight and level flight permits both the pilot and copilot to see the entire ground and sky in all directions and from nadir to zenith, with the exception of roughly two steradians of solid angle in the quadrant above and behind him. The necessary opaque struts which cross the transparent areas are so oriented and dimensioned that the distant scene as seen through the major areas of the plane appears to be continuous, advantage being taken of the fact that the pilot has two eyes whose lines of regard are not simultaneously occulted by narrow struts properly spaced and oriented. Utilizing the same fact of vision, instrument arrays and stressed skin structures are described, that the pilot can see through.

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**3,643,900**

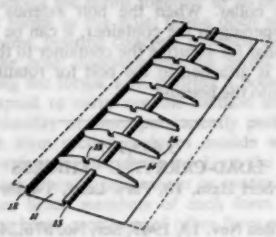
## JIG PANEL FOR AIRFOIL

**John P. Maloney, c/o World Engines 8960 Rossash Ave., Cincinnati, Ohio**

**Filed Mar. 2, 1970, Ser. No. 15,772**
**Int. Cl. B64c *3/20***
**U.S. Cl. 244—123** **4 Claims**

A formed jig panel and method of fabricating therefrom an aircraft wing, aileron, flap, horizontal stabilizer, vertical stabilizer, or fuselage. The panel is formed with channels, into which spars are secured, the panel becoming an integral part of the finished structure and forming the top or bottom surface thereof. The configuration of the leading and trailing

ends of the jig panel is such as to act as a locator and support for leading and trailing edge members which are secured



thereto. Ease of assembly, accuracy and proper alignment are assured.

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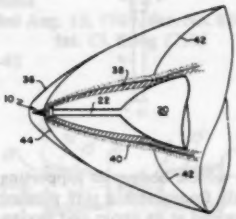
3,643,901

## DUCTED SPIKE DIFFUSER

Isidor C. Patapis, 4853 Cardell Ave. Apt. 1119, Bethesda, Md.

Filed May 27, 1970, Ser. No. 40,948
Int. Cl. B64c *23/04*
U.S. Cl. 244—130 7 Claims



A ducted spike diffuser for reducing forebody drag and rain erosion of blunt bodies operating at supersonic speeds. The spike has a directed conical front section to receive high-pressure oncoming air. This air is ejected at substantially right angles to the freeflow from an annular gap at the rear of the conical front section. This not only decreases pressure drag on the conical section but causes the conical bow shock wave-shear layer to occur radially further from the blunt body, resulting in better rain dispersion and decreased erosion of the blunt body.

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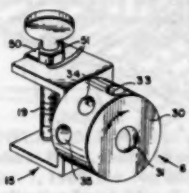
3,643,902

## AUTOMOBILE STAFF HOLDER

Emil V. Gualano, 10711 Beverly Blvd., Whittier, Calif.

Original application Oct. 17, 1969, Ser. No. 867,304, now Patent No. 3,540,685. Divided and this application July 9, 1970, Ser. No. 53,390
Int. Cl. G09f *17/00*
U.S. Cl. 248—40 4 Claims



A staff holder having a C-shaped member for attachment onto an elongated flange portion of an automobile. A socket device is mounted on and movable relative to the C-shaped member to present a vertical socket for vertically receiving a staff, regardless of the orientation of the C-shaped member. One embodiment includes a socket pivotally attached to the screw of the C member and another embodiment includes a rotating element attached to the C-shaped member and having a plurality of sockets therein, each at a different angle of inclination.

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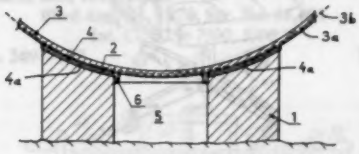
3,643,903

## BASE FOR A SPHERICAL CONTAINER

Per-Olof Eriksson, Sandviken, and Finn Borsum, Degerfors, both of Sweden, assignors to Uddeholms Aktiebolag, Uddeholm, Sweden

Filed Aug. 21, 1967, Ser. No. 662,176
Claims priority, application Sweden, Aug. 25, 1966, 11505/66
Int. Cl. F16m *13/00*
U.S. Cl. 248—146 4 Claims



When mounting a big spherical container on a base or foundation the bottom of the container has often to be provided with reinforcements. Such reinforcements can be omitted if the upper surface of the base has the general shape of a sphere, the radius of said sphere exceeding the radius of the container to such an extent that the weight of the container is substantially evenly distributed on the base when the container is filled to its maximal weight.

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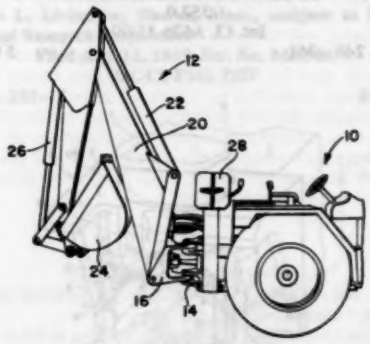
3,643,904

## PIN-MOUNTING MEANS

Larry Gene McMullen, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 8, 1969, Ser. No. 882,925
Int. Cl. F16h *21/44*
U.S. Cl. 248—289 7 Claims



Means for mounting a pin between two spaced mounting plates utilizing a pin having tapered end portions, each of which is fitted with a complementary, internally tapered sleeve, each sleeve, in turn, being received in an appropriate aperture in its respective mounting plate. The sleeve received

in the first mounting plate is provided with a shoulder to restrict its movement in a direction away from the second mounting plate, while the sleeve received in the second mounting plate is provided with a lock mechanism to urge the pin toward the first mounting plate and thus hold it rigidly in accurate alignment between the two plates.

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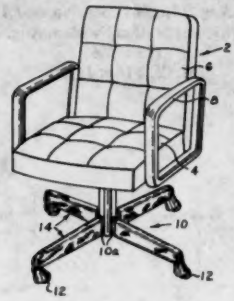
**3,643,905**

**PROTECTIVE SLEEVE FOR CHAIRS**

Bernice V. Kint, 1600 S. Eads, #215 South, Arlington, Va.

Filed May 5, 1970, Ser. No. 34,659
Int. Cl. A47b *95/04*
U.S. Cl. 248—345.1 2 Claims




Decorative sleeve means for protectively covering the radial leg portions of the base of a swivel-type chair, characterized in that the sleeve means are provided at one end with fringe means that conceal the extremity of the leg portion and protect an occupant against damage thereby. Preferably the sleeve means comprises a tubular body consisting of a stretch fabric formed of a synthetic fiber. At least one end of the sleeve is provided with a resilient portion of reduced diameter adapted to tightly engage the leg portion upon which the sleeve is mounted.

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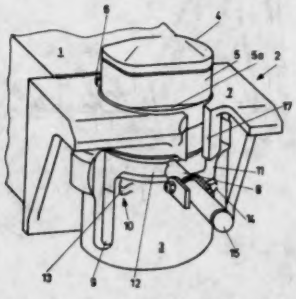
**3,643,906**

**RETRACTABLE PIVOT BOLT ARRANGEMENT**

Hans Werner, deceased, late of Neu-Isenburg, Germany (by Carl Staub, Administrator); Baldur Koschinat, and Otto Vormbaum, both of Neu-Isenburg, all of Germany, assignors to Jost-Werke GmbH, Frankfurt am Main, Germany

Filed Sept. 3, 1969, Ser. No. 870,590
Claims priority, application Germany, Sept. 4, 1968, P 17 80 352.0
Int. Cl. A62b *35/00*
U.S. Cl. 248—361 5 Claims




A pivot bolt arrangement for securing a container having socket-type openings to a housing mounted on a chassis frame support is arranged to be retracted into the housing when not in use. The housing forms a hollow or open space into which the bolt is retracted. The bolt extends upwardly through an opening in the top of the housing with its head resting on a collar. When the bolt extends through the socket-type opening in the container, it can be pivoted relative to the collar for securing the container to the housing. A pivot handle is attached to the bolt for rotating it and for retracting it into the housing.

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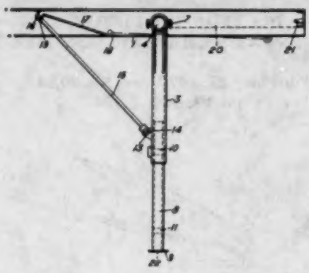
**3,643,907**

**LOAD-CARRYING VEHICLES**

Rowland Herbert Ham, 10, Park Lane, Twyford, Berkshire, England

Filed Nov. 13, 1969, Ser. No. 876,248
Claims priority, application Great Britain, Nov. 19, 1968, 54,921/68
Int. Cl. B60s *9/00*
U.S. Cl. 248—439 3 Claims



A demountable vehicle body with supporting legs, pivoted to the vehicle body frame with a stay pivoted to the lower portion of each leg and at its upper end having a pin moving along an inclined element fixed to the frame and engaging in a recess in the track in the erected position of the leg.

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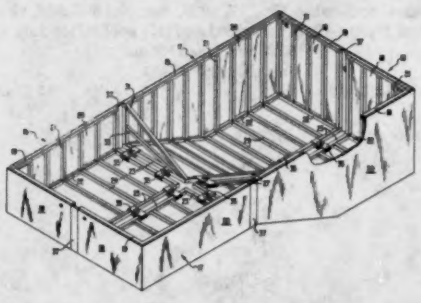
**3,643,908**

**APPARATUS FOR CASTING LARGE MONOLITHIC STRUCTURES**

Randolph Neil Laing, 4500 Richmond Henrico Turnpike, Richmond, Va.

Original application Apr. 2, 1968, Ser. No. 718,065, now abandoned. Divided and this application Apr. 10, 1970, Ser. No. 27,371
Int. Cl. E04g *11/02*
U.S. Cl. 249—27 19 Claims



This disclosure describes a method and apparatus for casting concrete swimming pools, tanks or walls, etc. In the below-the-ground applications, the preferred method

generally comprises the steps of: excavating a hole in the earth; placing inner permanently prebraced forms in the hole; aligning the forms in spaced relationship with the sides of the hole; locking the forms together in an open position; anchoring the forms in the hole; filling open spaces in the sides of the forms; pouring concrete between the forms and the sides of the hole; disconnecting the forms; closing the forms; removing the forms; and, pouring a bottom. The apparatus is adapted to carry out the method and generally comprises a plurality of inner permanently prebraced form sections. Each form section includes outside wall surfaces that define the inner walls of the pool, or the like. These form sections are braced against inner or center brace members. The inner brace members of each form section are locked to inner brace members of other form sections in a separated, predetermined relationship. Also included are means for filling wall spaces occurring between the wall surfaces of adjacent form sections; and, where applicable, means for attaching the form sections to the bottom of a hold. In addition, in connection with swimming pools means are provided for forming a coping at the upper edges of the wall surfaces of the form sections.

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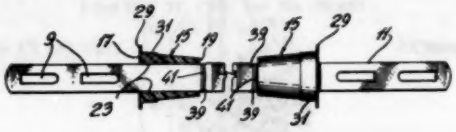
**3,643,909**

**PLASTIC PLUGS FOR USE IN CONCRETE FORMS**

**Louis Philippe Brosseau, Ville D'Anjou, Montreal, Quebec, Canada, assignor to Formex Ltd., Cite Jacques-Cartier, Quebec, Canada**

**Filed Aug. 15, 1969, Ser. No. 850,493**
**Int. Cl. E04g 17/06**
**U.S. Cl. 249—41** **2 Claims**



A plastic plug for use with a tie bar of concrete wall forms which is made of a plastic frustoconical body having an outer larger end intended to be applied against the inner surface of a form panel and having an inner smaller end that is embedded in the concrete of the wall. The plastic body is formed on the inside with a longitudinal through passage having a shape and size to slidably and snugly receive one end of a tie bar. The inner end of the body is closed but for the opening created by the passage so as to prevent entry of concrete inside the body. The outer end of the body has a circumferential sealing flange intended to be applied against the inner surface of a form panel to prevent entry of concrete inside the plug body.

In combination with this plug, a flat tie bar for holding concrete form panels in position and formed at one end with a pair of notches each provided along one of the two edges of the bar and opposite one another. A resilient ring pressed into the notches for abutment by the plug, said notches and ring being spaced from the end of the bar a distance such that the plug outer surface and the sealing flange may be slightly pressed, in use against the inner surface of a form panel.

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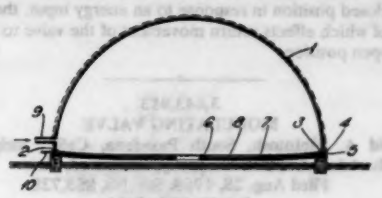
**3,643,910**

**INFLATABLE FORMS**

**Haim Helfetz, 24 Shderot Hazvi, Haifa, Israel**

**Filed Mar. 7, 1969, Ser. No. 805,143**
**Claims priority, application Israel, Mar. 7, 1968, 29599/68**
**Int. Cl. B28b 7/32**
**U.S. Cl. 249—65** **13 Claims**

Inflatable forms for use in the construction of shells, such as shells used in building, from material such as concrete, plastic materials or the like which is cast or gunned on the form after the latter has been inflated. In particular the invention deals with base ring structures for use with such forms.



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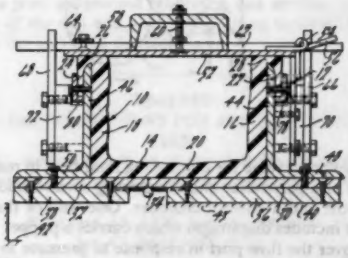
**3,643,911**

**PLASTIC MOLDING APPARATUS**

**Glenn J. Reid, Bloomfield Hills, Mich., assignor to Williams Products, Inc., Troy, Mich.**

**Filed Aug. 24, 1970, Ser. No. 66,401**
**Int. Cl. B29c 7/00, 5/00**
**U.S. Cl. 249—170** **7 Claims**



A mold assembly for use in molding foam plastic products such as simulated beams. The assembly includes a rubber mold liner and a steel jacket or carrier in which the liner is confined. The carrier is hinged so that opposite sides of the liner can be inclined away from one another to facilitate the removal of the molded product from the liner.

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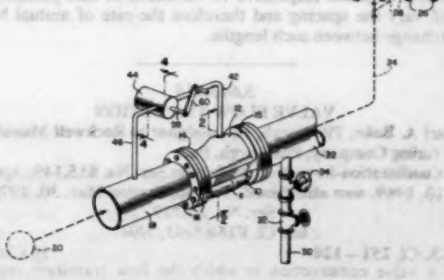
**3,643,912**

**DYNAMIC SHUTOFF VALVE**

**William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation**

**Filed Aug. 11, 1969, Ser. No. 848,986**
**Int. Cl. F16k 7/07**
**U.S. Cl. 251—5** **8 Claims**



A shutoff valve for main supply conduits in fluid-handling systems, such as fixed fire protection systems, where it is im-

perative that the supply conduit remain open at all times except when repairs and other maintenance operations require the system to be shut off. The valve is biased open and includes an actuator which moves the valve to and maintains it in a closed position in response to an energy input, the cessation of which effects return movement of the valve to its normal open position.

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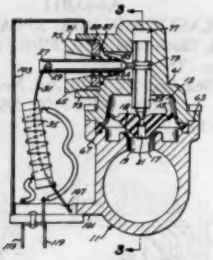
**3,643,913**

## MODULATING VALVE

**Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Aug. 28, 1969, Ser. No. 853,728**
**Int. Cl. F03g 7/06**
**U.S. Cl. 251—11** **7 Claims**



A modulating valve for controlling fluid flow in response to variance in a parameter and comprising a valve body having a flow port and a control chamber. One wall of the control chamber includes diaphragm which carries a poppet valve for seating over the flow port in response to pressure in the control chamber. A bleed passage communicates upstream pressure to the control chamber, and an exhaust passage relieves pressure from the control chamber. A plug is provided to selectively block flow through the exhaust passage, thereby to maintain the control chamber pressurized and to seat the poppet valve on the flow port. Positioning of the plug is controlled by an electrical control means which includes a thermally responsive element coupled with said plug and responsive to a parameter for adjusting the position of such plug to vary the pressure in said control chamber to control the positioning of said poppet. The thermally responsive element may be in the form of a thermostatic blade which has one end coupled with the plug and its opposite end constrained by the valve body to form an arcuate configuration. Such blade may then be heated by a heat motor having current therethrough controlled by a variable resistor including adjacent lengths disposed in heat exchange relationship with one another whereby expansion or contraction of the resistor, by means responsive to variations in said parameter, will vary the spacing and therefore the rate of mutual heat exchange between such lengths.

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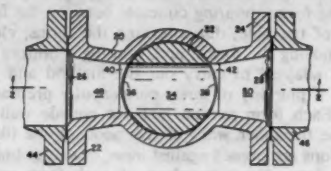
**3,643,914**

## VALVE FLOW TRANSITION

**Earl A. Bake, Pittsburgh, Pa., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.**

**Continuation-in-part of application Ser. No. 815,149, Apr. 10, 1969, now abandoned. This application Mar. 30, 1970, Ser. No. 23,779**
**Int. Cl. F16k 5/02, 5/04**
**U.S. Cl. 251—124** **18 Claims**

A valve construction in which the flow transition region extending from a valve port to the end of the valve body comprises a diffuser section diverging to give cross-sectional area change equivalent to that produced in a cone with an included cone angle of from 6° to less than 20° from the port to a location at or near the end of the body where it terminates



in an abrupt discontinuous section which enlarges the flow transition region substantially to the flow area of the conduit to which the valve is connected.

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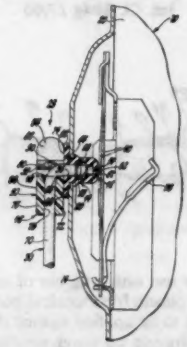
**3,643,915**

## ELBOW COUPLING FOR LEVELER EXHAUST CONDUIT

**Joseph W. Wanner, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 7, 1970, Ser. No. 78,844**
**Int. Cl. F16l 5/02; F16f 9/04, 9/50**
**U.S. Cl. 251—148** **5 Claims**



In preferred form, a coupling assembly including a resilient seal element located through the cylindrical outer movable wall of a pneumatic leveler unit for sealing an opening therein. An elbow coupling element has a longitudinal opening through a base portion thereof, a slotted head with shoulders thereon which cooperate to define a tube elbow support and a flat surface on one side thereof supported against the seal element to hold it tightly against the wall. The coupling element and the valve element are held together by a flexible tube that has one end directed through the valve element to be held in engagement therewith; an elbow portion supported by the elbow coupling element and a tube end maintained by the elbow coupling in parallelism with the outer surface of the cylindrical wall.

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**3,643,916**

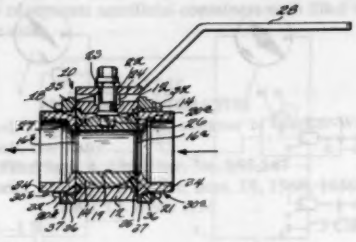
## BALL VALVE AND PIPE FLANGE ASSEMBLY

**George R. Sandenburgh, Wapping, Conn., assignor to Contromatics Corporation, Rockville, Conn.**

**Filed May 29, 1969, Ser. No. 829,078**
**Int. Cl. F16k 5/06**
**U.S. Cl. 251—151** **5 Claims**

A ball valve assembly is described in which the end pieces are made of two separate pieces rather than being single integral members. Each end piece comprises a cylindrical in-

sert made of a corrosion-resistant material having an end thereof secured in an abutting relationship with the valve body by a flange member made of a powdered metal or a casting or forging of a metal less precious than the cylindrical insert. Each cylindrical insert has an annular projection



around the exterior surface thereof which mates with an annular groove in the opening in the flange member which receives the cylindrical insert, and the annular projection on the insert has a machined indent which matches with a corresponding projection in the flanged member to prevent rotation of the insert with respect to the flange member.

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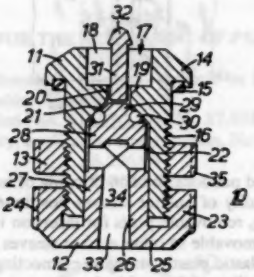
**3,643,917**

## PLASTIC DRAIN COCK

**Graham Ernest Griffiths, Horsham; Roger Keith Geiger, Shoreham, and John Walter Miles, East Grinstead, all of England, assignors to Shipston Engineering Company Limited**

**Filed May 25, 1970, Ser. No. 39,957**
**Int. Cl. F16k** *31/50*
**U.S. Cl. 251—215** **3 Claims**



Drain cock means including threadably connected first and second members, characterized in that the first member contains a first passage that is open at one end and is closed at the other end by the second member, said second member having a sealing portion adapted to engage the first member to close the drain cock. The second member includes also a spigot-forming portion that extends through said first passage and includes an enlarged end engageable with said first member to prevent or hinder the members from being completely detached from each other.

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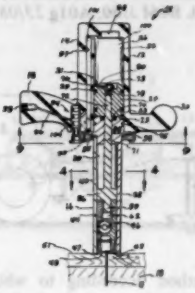
**3,643,918**

## NAIL-EXTRACTING DEVICE

**Rollo G. Ellis, Birmingham, Mich., assignor to Rollo G. Ditty and Gerald T. Gilleran, Detroit, Mich., part interest to each**

**Filed Dec. 15, 1969, Ser. No. 885,042**
**Int. Cl. B25c** *11/00;* **B66f** *15/00*
**U.S. Cl. 254—19** **15 Claims**

A device operable to remove nails, spikes or the like from any material within which said nails or the like may be driven, comprising a pneumatically operated impact member drivingly engaging a pair of pivotally mounted jaws and adapted to reciprocate the jaws between a first position in



which the jaws are pivoted relative to one another to engage the head of the nail and a second position in which the jaws withdraw the nail from the material.

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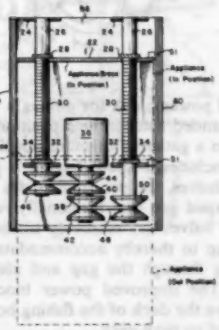
**3,643,919**

## SCREW-DRIVEN SUPPORT FOR APPLIANCES OR THE LIKE

**Andrew G. Sothen, 24 West National Drive, Newark, Ohio, and Richard S. Spaulding, 887 Woodhill Drive, Columbus, Ohio**

**Filed Oct. 13, 1970, Ser. No. 80,349**
**Int. Cl. B66f** *3/08, 3/18*
**U.S. Cl. 254—98** **4 Claims**



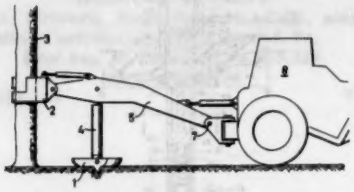
An apparatus for supporting and moving a major kitchen appliance to and from a given position. An electric motor operatively connected to a pair of screwjacks that are attached to the appliance readily facilitate the moving of said appliance a predetermined distance from its initial or original position. The motor is capable of rotatably driving the screwjacks in a forward or reverse direction to permit the appliance to be moved and then returned to its initial position.

3,643,920

## PROCEDURE AND DEVICE FOR FELLING OF TIMBER

Lars Harald Widegren, Arent Frapegatan 31, Kiruna, and Tage Oskar Keskitalo, Knavagen 9, Tuolluvaara, both of Sweden

Filed Mar. 17, 1969, Ser. No. 807,755
Claims priority, application Sweden, June 28, 1968, 8943/68
Int. Cl. B66f *3/00*; A01g *23/08*
U.S. Cl. 254—124 2 Claims



Timber-felling method according to which the tree is drawn up with its roots by a mechanical device, the tree being first pulled out of the ground in a vertical direction and thereafter prized at an increasing angle thereto.

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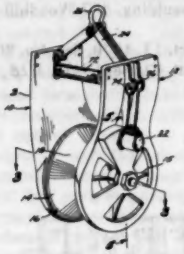
3,643,921

## POWER BLOCK

Mario J. Puretic, 259 6th Ave. N., Monte Cristo Isle, Tierra Verde, Fla.

Continuation of application Ser. No. 715,926, Mar. 25, 1968, now abandoned. This application June 9, 1970, Ser. No. 66,598
Int. Cl. A01k *73/06*
U.S. Cl. 254—138 12 Claims



An improved power block for pulling a fishing net from a submerged expanded fish-catching position onto the deck of a fishing boat in a gathered-together position. The improved power block includes a spool having a pair of outwardly tapering spool halves, the proximate sides of which define a generally V-shaped gap that frictionally receives the fishing net. The spool halves are relatively tiltable for varying the angle of the gap to thereby accommodate varying bulks of the net passing through the gap and also varying friction requirements. The improved power block may either be suspended above the deck of the fishing boat or alternatively may be mounted on such deck.

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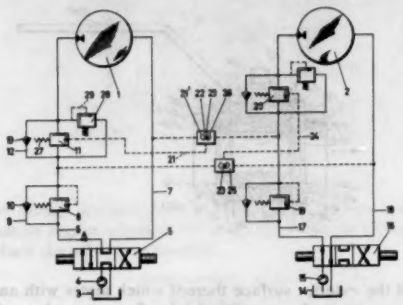
3,643,922

## DEVICE FOR THE CONTROL OF THE SHIFT MOVEMENTS OF A FLOATING BODY

Franciscus Henricus Van Der Linde, Wassenaar, Netherlands, assignor to N. V. Industrieele, Handelscombinatie, Netherlands

Filed June 30, 1969, Ser. No. 837,632
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 2 Claims

A suction dredger comprising a floating body carrying a suction pipe having a rotatably driven cutter at the lower end thereof and hydraulically operated winches to haul and veer the suction pipe, is characterized by means to limit the braking action on the veering winch when the other winch is hauling, and to increase the braking action on the veering winch when the load on the hauling winch decreases below a



predetermined value. In the case of hydraulically operated winches, this is done by providing throttle valves in the fluid circuits of the winches, with each throttle valve responsive to the pressure in the high-pressure branch of the circuit of the other winch.

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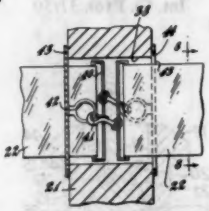
3,643,923

## PADDOCK

Christian H. Kirchhoff, Jr., P.O. Box 286, Freehold, N.J.

Filed July 15, 1969, Ser. No. 841,942
Int. Cl. E04h *17/18*
U.S. Cl. 256—25 3 Claims



An improved paddock for conditioning of horses and comprising a plurality of anchor sleeves positioned at predetermined spacing, removable posts for insertion in these anchor sleeves and removable to other anchor sleeves to relocate the paddock, an elastic plastic stringers connecting the posts and defining the outline of the paddock.

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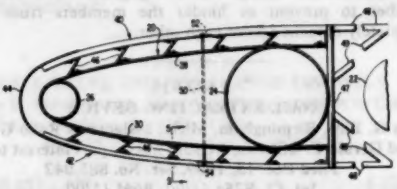
3,643,924

## HIGHWAY SAFETY DEVICE

John C. Fitch, Falls Village, Conn., assignor to Fibco, Inc., Hartford, Conn.

Filed Sept. 24, 1970, Ser. No. 75,074
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 10 Claims



A highway safety device for deflecting or decelerating a vehicle as it approaches a highway hazard comprising a

deformable container, the lower portion of which is filled with a low mass, collapsible core structure, and the upper portion of which contains a high-density dispersable mass, such as sand. In one form the device includes an attached or free-standing external guard rail. An impact attenuation system is also provided including the deformable container and an array of separate sacrificial containers each filled with a dispersable mass.

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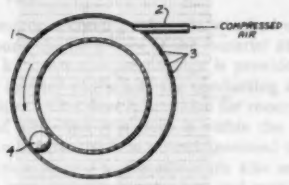
**3,643,925**

**PNEUMATIC VIBRATOR**

Phillipp Uebel, Munich, Germany, assignor to Wacker-Werke KG, Munich, Germany

Filed Sept. 4, 1969, Ser. No. 855,247
Claims priority, application France, Sept. 10, 1968, 165600
Int. Cl. B06b *1/18*
U.S. Cl. 259—1 R 3 Claims




Method and apparatus for compacting concrete and similar masses according to which the medium to be compacted is, by means of a pressure medium, actuated eccentric mass circulated in a tubular housing with circular cross section, subjected to oscillations.

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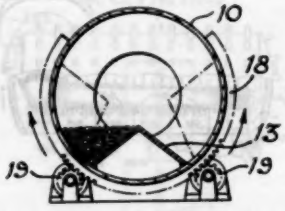
**3,643,926**

**APPARATUS FOR THE TREATMENT OF PARTICULATE SOLIDS**

Alan Grieve, Bramhall, England, assignor to Simon-Carves Limited, Cheshire, England

Filed Nov. 5, 1970, Ser. No. 87,051
Claims priority, application Great Britain, Nov. 18, 1969, 56,296/69
Int. Cl. B01f *13/00*
U.S. Cl. 259—2 11 Claims



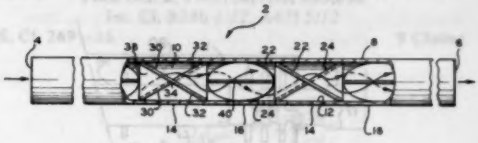

Apparatus for the treatment of particulate solids comprises a vessel disposed with its longitudinal axis in a horizontal or inclined direction and adapted to receive the material to be treated at one end for discharge at the other end after passage therethrough, the vessel having a longitudinally extending inwardly directed protuberance in its lower part and being mounted for oscillatory movement about a longitudinally extending axis and means for effecting said movement whereby material passing through the vessel is repeatedly transferred from side-to-side of said inwardly directed protuberance.

**3,643,927**

**STATIONARY MIXTURE AND METHOD FOR MIXING MATERIAL**

Ross A. Crouch, Borger, Tex., assignor to Phillips Petroleum Company

Filed Oct. 15, 1970, Ser. No. 81,080
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 14 Claims




A conduit has at least first and second pairs of material guiding plates angularly disposed therein with each plate pair attached to a separate wall means for separately dividing a material stream and individually rotating and mixing each stream portion passing therethrough.

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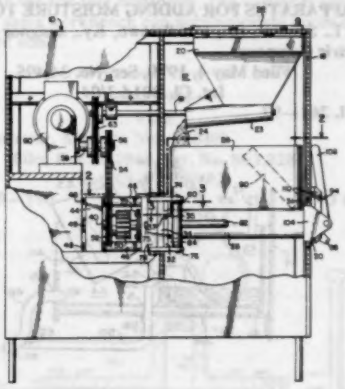
**3,643,928**

**FOOD MIXING MACHINE**

Richard A. Stollman, Cheltenham, Pa., and Vincent N. Cedrone, Marlton, N.J., assignors to Fantastic Fudge, Inc., New York, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,403
Int. Cl. B01f *7/08, 15/02*
U.S. Cl. 259—6 7 Claims

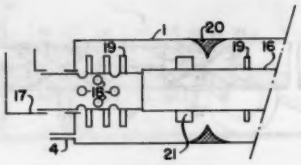


Mixing and extruding apparatus for the preparation of a confection comprises front and rear bearing blocks in which two axles are journaled, mix extrude screws detachably secured to said axles and extending into a mixing chamber, and means for detachably clamping the mixing chamber to the front bearing block. The mixing chamber includes a barrel in which a recirculation plate is positioned to rotate the mix back into the screws for continuous mixing and extruding. A slidable gate can be moved to open an outlet aperture in the mixing chamber so that the mixture can be expelled from the chamber by the screws.

## 3,643,929
## APPARATUS FOR THE PREPARATION OF AGGLOMERATES

Bernardus B. Quist, and Jacobus A. J. Smit, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,461
Claims priority, application Netherlands, Feb. 26, 1969, 6902962
Int. Cl. B01f 7/04
U.S. Cl. 259—9 5 Claims

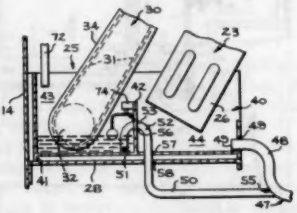



Apparatus for the preparation of agglomerates of one or more solid substances from a suspension thereof in a liquid with a density lower than that of the agglomerates. The apparatus includes an oblong, substantially cylindrical vessel which is provided near one of the ends with a supply for the suspension of the solid substances, and, if desired, with a supply for one or more auxiliary substances, near the opposite end, with a discharge for liquid and agglomerates. A stirring device consisting of a rotatable shaft is provided in the vessel which is in a coaxial position thereto and to which a number of stirring elements are attached. An annular baffle is disposed in the proximity of at least one, but at most half of the total number of those stirring elements, and on the downstream side thereof, perpendicular to the centerline of the vessel and fastened to the wall thereof.

## 3,643,930
## APPARATUS FOR ADDING MOISTURE TO AIR

James L. Schulze, Sr., Middletown, Ky., assignor to General Electric Company

Filed May 4, 1970, Ser. No. 34,495
Int. Cl. B01d 3/04
U.S. Cl. 261—97 6 Claims

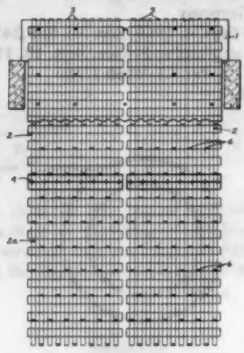



Improved apparatus is provided for adding moisture to air. The apparatus includes hollow cabinet means, having an air inlet and outlet, and humidifier means for adding moisture to an air stream flowing between the inlet and outlet. The humidifier means includes evaporative media means mounted for movement across the air stream and through a moisture reservoir that is supplied with liquid, such as tap water or the like. In accordance with the present invention, means are provided for purging or draining fluidized material, such as tap water and the mineral salts precipitated therefrom, from the reservoir and these drain means include a fluid inlet that is connected to the reservoir via siphon means comprising conduit means including an inverted generally U-shaped section.

## 3,643,931
## SPRAY SYSTEM FOR COOLING TOWERS

Herbert Henning, Langenberg; Werner Alt, Bochum, and Paul Reiter, Hattingen, all of Germany, assignors to Maschinenbau-Aktiengesellschaft Balcke, Bochum, Germany

Filed Nov. 19, 1969, Ser. No. 878,014
Claims priority, application Germany, Nov. 19, 1968, P 18 09 605.4
Int. Cl. B01f 3/04
U.S. Cl. 261—111 6 Claims

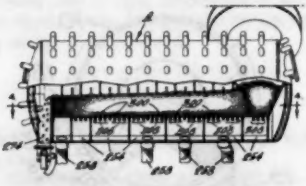


A trickling assembly for cooling towers, according to which lattice means are supported by trickling plates while at least a portion of said lattice means extends to a level lower than that of said trickling plates, said portion carrying spray slats arranged in a vertically spaced relationship to each other.

## 3,643,932
## METHOD AND APPARATUS FOR CALCINING PARTICULATE MINERAL MATERIALS

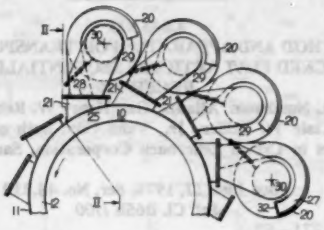
Bolton L. Corson, Philadelphia, and Budd R. Royer, Lansdale, both of Pa., assignors to G. & W. H. Corson, Inc., Plymouth Meeting, Pa.

Filed Apr. 3, 1970, Ser. No. 25,392
Int. Cl. F27b 3/06, 15/00
U.S. Cl. 263—21 C 11 Claims



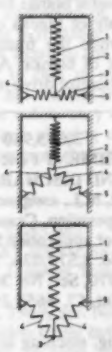
A method and apparatus for the improved calcining of particulate mineral materials adapted particularly for the vibratory type kiln wherein a bed of particulate material is intermittently vibrated or reciprocated during the burning of a gaseous fuel therein. In the present invention, gaseous fuel and preheated air are separately introduced into the particulate material bed at a plurality of regularly spaced locations. This permits a uniform penetration of the air and fuel into the interstices of the particulate material and a consequent uniform burning of the fuel throughout the material bed. As a result, a deeper bed may be maintained, and a more uniform product is obtained at a faster rate and with lower fuel consumption.

3,643,933
## COOLER FOR ROTARY KILN
Daniel McDonald, Beaconsfield, Quebec, Canada, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Nov. 5, 1970, Ser. No. 87,246
Int. Cl. F27b 7/02
U.S. Cl. 263—32 4 Claims



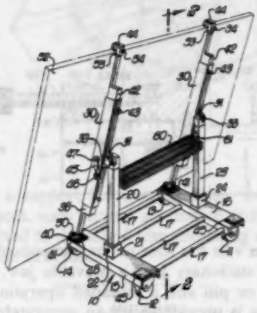
A plurality of material cooling tubes are attached in parallel alignment around the periphery of the material discharge end of a rotary kiln. An oblique passage is provided from each tube to the interior of the kiln for conducting air from the tube to the kiln. A first duct is provided for receiving hot material from the kiln. The first duct is within the oblique passage and extends from the kiln a predetermined distance to a terminal portion thereof intermediate the kiln and tube. A second duct is provided which has a first end portion connected to the terminal portion of the first duct and the second duct projects out of the oblique passage to be exposed to surrounding atmosphere. The second duct has a second end portion connected to the tube. The second duct is a spiral that turns away from the adjacent end of at least about 180° to where it discharges material into the tube and the tube projects through the space inwardly of the spiral duct toward the adjacent discharge end of the kiln. The spiral duct, being exposed to atmosphere, is cooled and material therein is cooled, to reduce thermal stress in the assembly.

3,643,934
## RESILIENT SYSTEM WITH COMPENSATING DEVICE FOR VARIABLE FORCE EXERTED THEREBY
Cornelis Bordes, Bloemendaal, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands
Filed Dec. 4, 1969, Ser. No. 882,210
Claims priority, application Netherlands, Dec. 4, 1968, 6817380
Int. Cl. F16f 15/02
U.S. Cl. 267—155 6 Claims



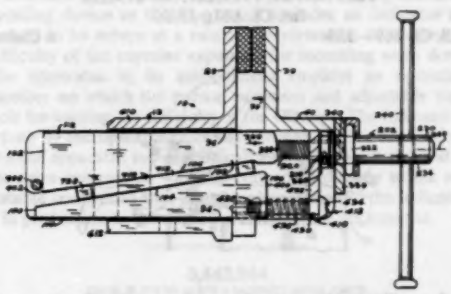
A mechanical or fluid spring acts with a force that varies according to its extension. These force variations are compensated by a compression spring that acts in concert with the main spring between overcenter positions in which the compression spring acts with or against the main spring. Preferably, there is an opposed pair of compression springs whose forces act toward and balance each other in the overcenter position.

3,643,935
## DOOR-HANGING WORKBENCH
Archie Y. Bell, 1415 E. Mountain St., Glendale, Calif.
Filed Oct. 2, 1969, Ser. No. 863,050
Int. Cl. B25b 1/22; A47f 5/12
U.S. Cl. 269—16 9 Claims



A door-hanging workbench consisting of a chassis mounted on wheels for supporting a door in one position or another while cutouts are made on one side for hinges, on the other side for mounting such hardware has knobs, latch bolts and locks. Horizontal carriers support and clamp the door on the bench and are tiltably mounted on upright supports so that the door can be held with either edge uppermost or with the flat side horizontal. The carrier is adjustable so that the same workbench can accommodate doors of various different sizes.

3,643,936
## VISE
John L. Hostetter, Murray, Nebr. 68409
Filed Oct. 6, 1969, Ser. No. 863,928
Int. Cl. B25b 1/02
U.S. Cl. 269—190 3 Claims



A vise having a frame on which a stationary jaw is mounted, a sliding carriage mounted in said frame in a manner for movement of a movable jaw on the carriage to move toward and away from the stationary jaw, such free sliding being accomplished by an operator simply pushing the

movable jaw toward the stationary jaw by hand quickly, pushing and pulling wedges which are adapted to lock themselves in a position in the frame at times when a lever is operated, following engagement of the jaws with the workpiece, further movement of the lever causing the jaws to be pressed together and rotation of the lever in an opposite direction causing the jaws to pull apart and the wedges to unlock themselves from the frame.

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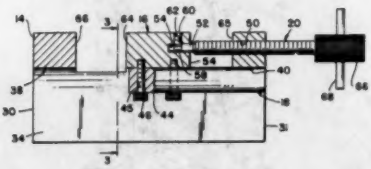
**3,643,937**

## PRECISION VISE

**Edwin Russ, 27736 Palmer Lane, Madison Heights, Mich.**

**Filed July 31, 1969, Ser. No. 846,560**
**Int. Cl. B25b *1/24***
**U.S. Cl. 269—251** **4 Claims**



The precision vise has four major components including a base having a stationary jaw, a movable jaw, a cylindrical guide element or pin and a threaded operating rod or element. The base is provided with an accurately finished jaw support surface having a longitudinally extending slot or groove therein extending from one end of the base to the other end. The cylindrical guide element is located in the slot in engagement with curved or part cylindrical guide surfaces located on opposite sides of the slot. The movable jaw having an accurately finished bottom surface is mounted on the support surface and is fastened to the cylindrical guide element. The threaded operating rod is rotatably carried by the base and is connected to the movable jaw. Manipulation of the operating rod is effective to move the movable jaw in one direction only in a straight path towards or away from the stationary jaw depending on the direction of rotation of the rod, with the guide element traveling in the slot in engagement with the guide surfaces to thereby maintain the movable jaw properly oriented and aligned.

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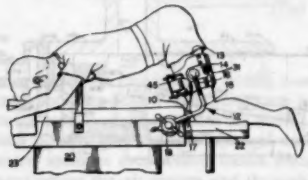
**3,643,938**

## DETACHABLE BRACE FOR CULDOSCOPY OPERATIONS

**John Henry Levasseur, Main St., North Berwick, Maine**

**Filed Nov. 24, 1969, Ser. No. 879,113**
**Int. Cl. A61g *13/00***
**U.S. Cl. 269—328** **6 Claims**



A readily usable pair of braces for quick affixation, each on an opposite side of an elongated operating table, after a patient has assumed the knee-chest, hypoextension position. The braces each have a longitudinally extending, lower arm, supported generally horizontally in one of the table clamps, each have an integral, upwardly extending support arm, inclining inwardly toward the other laterally of the table and each have an inwardly facing, concaved thigh engaging padded plate with belt fastened around one of the thighs of the patient so that the knees of the patient are anchored against movement while the surgeon performs the operation.

The angle of affixation is quickly changeable if the surgeon finds the patient too obese, by merely loosening the table clamps.

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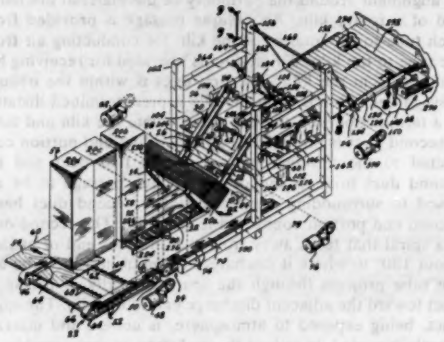
**3,643,939**

## METHOD AND APPARATUS FOR TRANSPORTING STACKED FLAT ARTICLES SEQUENTIALLY TO A RECEIVER

**Henry A. Nussbaum, Atlanta, Ga.; Henry W. Rehr, Concord, and Clair W. Tellier, Jr., Yuba City, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.**

**Filed June 22, 1970, Ser. No. 48,219**
**Int. Cl. B65h *1/00***
**U.S. Cl. 271—62** **21 Claims**



An endless transfer conveyor has its article-supporting surface initially positioned in a substantially vertical article-receiving position and a pair of legs extend perpendicularly from the bottom end thereof. A stack of box blanks is moved by a stack conveyor to a position over the legs and against the article-supporting surface of the transfer conveyor. The transfer conveyor is then pivoted through an arc slightly greater than 90° to an article-discharging position and the blanks are deposited sequentially from the discharge end of the transfer conveyor onto a shingling conveyor. The shingling conveyor transfers the blanks sequentially onto a receiver. Scraper arm means are provided to accelerate removal of the last several blanks from the transfer conveyor to accumulate a supply of blanks on the infeed end of the shingling conveyor while the transfer conveyor returns to pick up another stack of blanks. Appropriate switch actuators are provided to energize drive motors as required.

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**3,643,940**

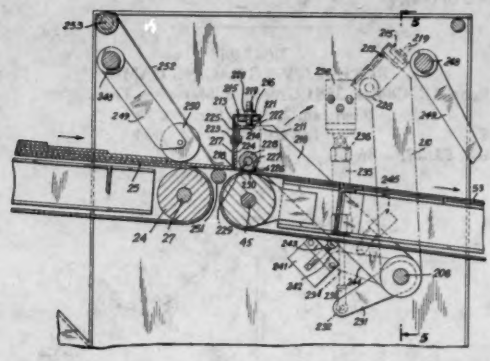
## CONTROL ATTACHMENT FOR SHEET CONVEYING, STACKING AND DISCHARGE EQUIPMENT

**John Lopez, Westfield, N.J., assignor to Universal Corrugated Box Machinery Corporation, Cranford, N.J.**

**Continuation-in-part of application Ser. No. 838,405, July 2, 1969, now Patent No. 3,574,024. This application May 6, 1970, Ser. No. 35,185**
**Int. Cl. B65h *29/68***
**U.S. Cl. 271—76** **6 Claims**

In a sheet conveying, stacking and discharge apparatus of the type in which feed from a sheet-forming apparatus to a stacking apparatus is periodically interrupted to permit the stacked sheets to be cleared, pivotal gate means for blocking movement of fed sheets to the stacking apparatus during the

period in which stacked sheets are cleared. The gate means is characterized by a freedom from interference with the orientation of sheets stacked thereagainst in the course of movement from the blocking to the unblocking position.



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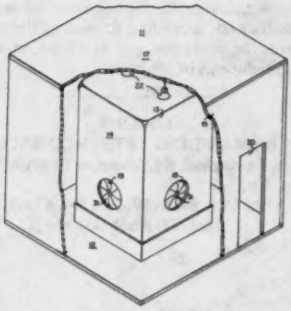
**3,643,941**
**RELAXATION CHAMBER**
**Gail Carleton Kashar, 5737 Howe St., Pittsburgh, Pa.**
**Filed Mar. 18, 1969, Ser. No. 808,218**
**Int. Cl. A63g *31/00***
**U.S. Cl. 272—2** **2 Claims**



There is disclosed a relaxation chamber including a room in which there is a mass of very light, very white, small spheroidal particles, typically composed of expanded polystyrene such as is used in making Styrofoam. The occupants of the room can lie down, sit or move in the mass. The movement gives a sensation similar to that of moving in a swimming pool. The room typically has translucent walls and/or ceiling and colored lights, whose colors may change, are projected on the particles producing a pleasing color effect. The mass may be fluidized by blowing air through it from the base of the room.

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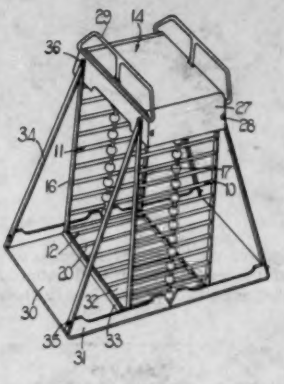
**3,643,942**
**PLAY DEVICES**
**Gerald G. Williams, 71 Listowel Road, Kings Heath, Birmingham, England**
**Filed July 23, 1969, Ser. No. 843,969**
**Claims priority, application Great Britain, July 27, 1968, 35,966/68; Dec. 18, 1968, 60,175/68**
**Int. Cl. A63b *17/04***
**U.S. Cl. 272—60** **8 Claims**

A childrens' play device comprising side frame and end members, one of which is detachable. One alternative end member makes the structure suitable for use as a collapsible playpen or base for a table or trampoline and the other alternative end member makes the structure suitable as a climbing frame or a support for a swing, slide, seesaw, or other similar apparatus, such second alternative end member being rigidly connected to the side frame and being arranged in use at the top of the structure.



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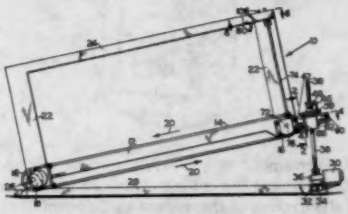
**3,643,943**
**EXERCISER WITH WORK-INDICATING MECHANISM**
**Curtis L. Erwin, Jr., 1510 S.E. 41st, Portland, Oreg., and Gene D. Fosdick, 4910 S.E. 35th Ave., Portland, Oreg.**
**Filed July 28, 1969, Ser. No. 845,245**
**Int. Cl. A63b *23/06, 69/06, 69/16***
**U.S. Cl. 272—69** **12 Claims**



Exercise apparatus such as a treadmill, rowing machine, pedaling device or the like which includes an indicator arranged to be driven at a rate in proportion to the degree of difficulty of the exercise expended for recording work done. The apparatus in its embodiment employs an operating member on which the person exercises and adjustable controls for varying the difficulty of the exercise. The indicator is driven by the operating member through a drive connection, and the apparatus includes adjustment means incorporated in the drive connection which is connected directly to the adjustable controls so that the rate of operation of the indicator is in proportion to the degree of difficulty of the exercise.

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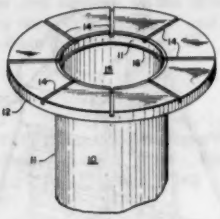
**3,643,944**
**GOLF CUP RETAINING HOLDER**
**Bill A. Boyes, 131 West Maple, Columbus, Kans.**
**Filed Nov. 4, 1969, Ser. No. 873,923**
**Int. Cl. A63b *57/00***
**U.S. Cl. 273—34 R** **3 Claims**

A golf cup retaining holder is provided within which is supported a conventional golf cup for use on greens made of artificial grass. The retaining holder is positioned intermediate

the artificial green and underlying base over which the artificial green is installed and includes a flat channeled disc member having a central opening. The disc is adapted to be secured to the back side of the artificial green with the central opening over the hole. The channels serve to vent the area beneath the artificial green to the atmosphere. A cylindrical member extends downward into the hole and supports a golf cup.



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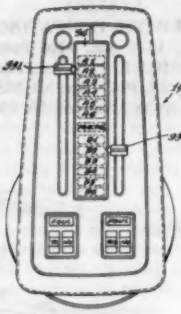
**3,643,945**
**CONTROL FOR PRACTICE BOWLING**
**Robert Torresen, and Herbert D. Grosvenor, both of Muskegon, Mich., assignors to Brunswick Corporation**
**Filed June 5, 1969, Ser. No. 830,815**
**Int. Cl. A63d** *5/00*
**U.S. Cl. 273—54 C** **8 Claims**



The improvement in a bowling scoring system including means for enabling the rolling of one or more practice balls without the cycling of the system so that pinfall achieved by the practice balls is not tabulated. In the exemplary embodiment, the same is achieved with the maintenance of various peripheral functions involving the automatic pinsetter and bowler identification interlocks.

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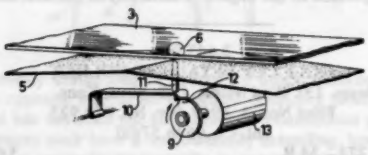
**3,643,946**
**TOY FOOTBALL GAME**
**Klaus Johannes Ylinen, Frejgatan 13, Stockholm, Sweden**
**Filed Nov. 24, 1969, Ser. No. 879,368**
**Claims priority, application Sweden, Nov. 22, 1968, 15896/68**
**Int. Cl. A63b** *71/06*
**U.S. Cl. 273—85 R** **1 Claim**



A ball game amusement device for two contestants comprises a playing field beneath a transparent cover and a ball that is sent back and forth across the field by a projector for each player. The central portion of the ball field can be raised to catch and retain the ball between the ball field and the underside of the transparent panel, and a power-driven rotating cam raises the central portion of the ball field at the end of play.

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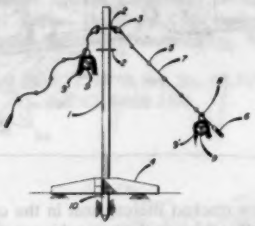
**3,643,947**
**ROPE FLIPPING RACING GAME**
**Ronald B. Collins, 3581 Greenleaf, Memphis, Tenn.**
**Filed Jan. 2, 1970, Ser. No. 149**
**Int. Cl. A63f** *9/14*
**U.S. Cl. 273—86 E** **3 Claims**



A game to be played in or out of doors by one person against time or by a number of people in competition, the articles used in play comprising a removable but firmly upstanding center post, a length of rope for each player and tethered to the said post at substantially shoulder height, a handgrip at the outer end of the rope, a plurality of obstacles attached to the rope in spaced relation and, for each player, a play piece in this instance a wigged head linked to his respective rope and slidable thereon between successive ones of said obstacles and, according to rules of the game, hopped or flipped over the obstacles, one at a time, by up, down and sidewise manipulations of the rope.

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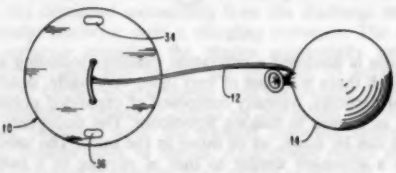
**3,643,948**
**REBOUNDING TETHERED BALL**
**Leroy Coates, Covington, Ky., assignor to Willy Whoper, Inc., Covington, Ky.**
**Filed Oct. 24, 1969, Ser. No. 870,416**
**Int. Cl. A63b** *33/00*
**U.S. Cl. 273—97** **4 Claims**



A toy comprises a circular plate having one end of a resilient member releasably connected thereto. The other end of the resilient member is releasably connected to a fluid-filled, collapsible element. The releasable connection between the resilient member and the fluid-filled collapsible element allows the fluid-filled, collapsible element to be filled whenever there is leakage of fluid from the collapsible element.

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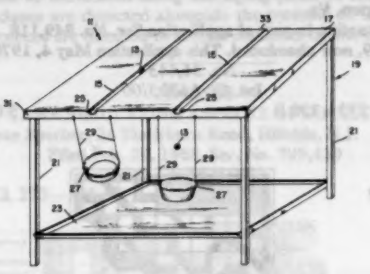
**3,643,949**
**MARBLE GAME WITH MOVING TARGET**
**Naman G. Habash, 15249 S. Van-Ness, Gardena, Calif.**
**Filed Mar. 16, 1970, Ser. No. 19,901**
**Int. Cl. A63b** *63/04*
**U.S. Cl. 273—101** **3 Claims**

A game played with rolling bodies such as marbles and the like, the marbles being rolled along a track, under an end of

which is suspended a swinging receptacle or basket to catch only those marbles which are caused to fall from the end of



the track at a time to reach the basket directly below the end of the track as it swings to-and-fro through such position.

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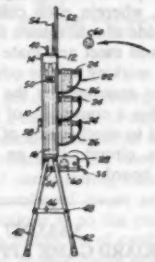
**3,643,950**
**TARGET FOR BALL TOSS GAME**
**Howard A. Holk, 12025 Rutherford, Detroit, Mich.**
**Filed Sept. 18, 1970, Ser. No. 73,482**
**Int. Cl. A63b *63/00***
**U.S. Cl. 273—105 R** **1 Claim**



A ball toss game, suitable for either indoor or outdoor play, consisting of a box having in the front side thereof a plurality of openings. A target basket, adjacent each of the openings in the box, receives the tossed ball and directs the same into such openings. Ducts in the box conduct the balls from each of the openings to a separate compartment, having an assigned numerical value which the players use in computing their scores. In use, the box may either be suspended from a fixed support, or supported in an upright position by collapsible legs.

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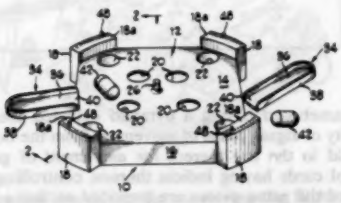
**3,643,951**
**SURFACE PROJECTILE GAME DEVICE WITH INTERMITTENTLY CLOSED TARGET OPENINGS**
**Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates**
**Filed Aug. 21, 1970, Ser. No. 65,944**
**Int. Cl. A63b *67/14***
**U.S. Cl. 273—108** **4 Claims**



A game device including a base having apertures therein with a rotatable disc underlying the apertures and having a radial segmental opening therein. Launching trays and capsulelike playing pieces are also provided for launching the capsules towards the playing surface in an attempt to feed the capsules through one of the openings in the playing surface in timed relationship to the rotation of the underlying disc having the segmental opening therein.

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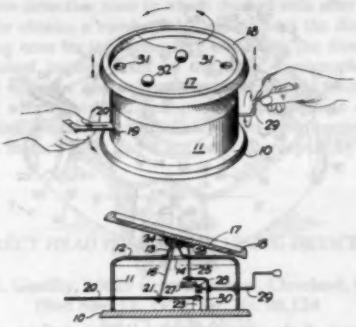
**3,643,952**
**TILTING SURFACE BALL GAME**
**Earl D. Sprowl, 251 West Eight St., Salem, Ohio**
**Filed Mar. 20, 1970, Ser. No. 21,280**
**Int. Cl. A63b *67/00***
**U.S. Cl. 273—110** **2 Claims**



A game device having a housing and a rimmed plate mounted thereon for tilting about two axes while being revolved, the tilting of the plate being controlled by one lever and the revolving of the plate being controlled by a crank whereby two persons may control the action of the rimmed plate and one or more spheres rolling thereon.

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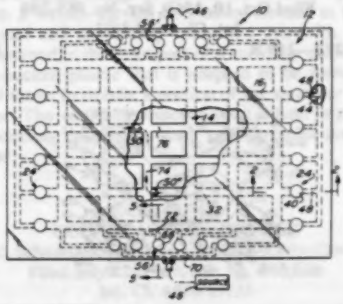
**3,643,953**
**FLUID PRESSURE OPERATED GAME**
**Jon S. Fixler, Philadelphia, Pa., assignor to Industrial Patent Development Corp., Phila., Pa.**
**Filed Aug. 13, 1970, Ser. No. 63,382**
**Int. Cl. A63d *3/02***
**U.S. Cl. 273—119 B** **12 Claims**



A game device is disclosed, suitable for play by two or four persons representing two opposing sides, comprising a "board" having interconnected sets of conduits, and projectiles normally disposed at opposite ends of one of the sets capable of being individually released and propelled through their conduits by selectively applied fluid pressure. The opposing sides control the release of their projectiles and the

flow of fluid in conduits in one direction, the object of the game being for one side to drive its projectiles from its end of the conduits to its opponent's end, against a defense mounted by its opponent.

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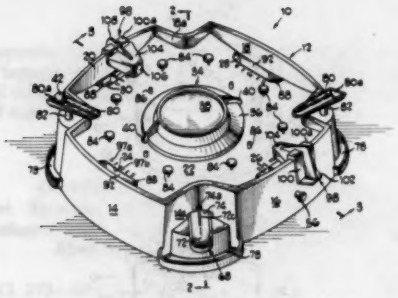
3,643,954

## GAME WITH PROJECTILE LAUNCHING ROTOR

Burton S. Meyer, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin & Associates

Filed Aug. 8, 1969, Ser. No. 848,574
Int. Cl. A63d 3/02
U.S. Cl. 273—119 A 10 Claims



A game of the type having a playing surface, a playing piece and playing piece recesses at the edges of the playing surface characterized by the provision of a playing piece launching rotor positioned centrally of the playing surface, the speed and direction of the rotor being controllable by the player to launch the playing piece into a desired recess. Movable blocking elements are provided adjacent the recesses for preventing the entry of the playing piece into a recess. Also, the game is characterized by the provision of reversible recess insert pieces capable of being oriented in one fashion to block some of the recesses when the game is being played with a reduced number of players, or to be oriented in a reverse fashion to provide plural cavities for receiving the playing piece.

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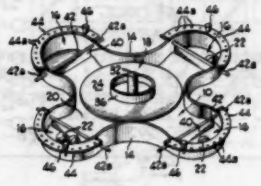
3,643,955

## SKILL-TYPE GAME

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates

Filed Oct. 10, 1969, Ser. No. 865,288
Int. Cl. A63d 3/02
U.S. Cl. 273—119 R 12 Claims



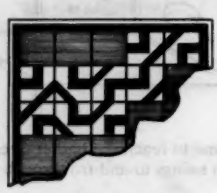
A skill-type game which comprises motive means for propelling objects outwardly therefrom at random intermittent intervals in a plurality of angular directions toward a plurality of receiving positions disposed angularly about the motive means. The receiving positions have gates normally blocking the entrance thereto and the gates are selectively movable by a player to open the entrance to the receiving positions in an attempt to "catch" the propelled objects.

3,643,956

## BOARD GAME APPARATUS

Bernard X. Bovasso, Rm. 302, 1911 Jefferson Davis Hwy., Arlington, Va.

Continuation-in-part of application Ser. No. 849,118, Aug. 11, 1969, now abandoned. This application May 4, 1970, Ser. No. 34,443
Int. Cl. A63f 3/00
U.S. Cl. 273—130 R 3 Claims



This invention relates to a game played with square members, which may be cards or blocks, disposable upon a playing board having squares defined thereon, each of said cards or blocks having an identical pattern marked thereon, said pattern comprising markings achieving equal divisions upon the sides of the square, and having contrasting colors defining said pattern, wherein each color occupies an identical portion of each side of said square and wherein any terminus of any marking will meet and mate with any other terminus of a like colored marking on any other member. The purpose of the game is to generate, by the sequential placement of said squares, either a continuity of pattern from one side of the playing board to another side of the playing board, or the completion of a circuit, i.e., an endless track or path, anywhere on the board.

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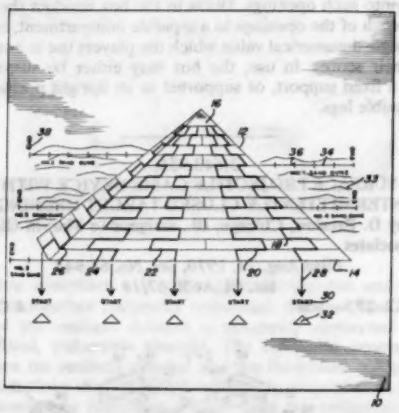
3,643,957

## BOARD GAME APPARATUS

Clifford F. Bryant, 19 Washington St., Struthers, Ohio

Filed Mar. 19, 1970, Ser. No. 21,065
Int. Cl. A63f 3/02
U.S. Cl. 273—134 AD 2 Claims



A gameboard having a pyramid depicted thereon and a plurality of zigzag paths of movement from the bottom of the pyramid to the top thereof for movement of game pieces. Control cards having indicia thereon controlling the movement of the game pieces are provided so that a plurality of players may endeavor to move their game pieces from a start position to a finish position at the top of the pyramid by

drawing cards which instruct them to move the game piece in a particular manner, with certain of the cards depicting an increment of movement along the zigzag paths of movement. Sand dunes are depicted alongside the pyramid to which the game pieces are directed in certain instances by the cards.

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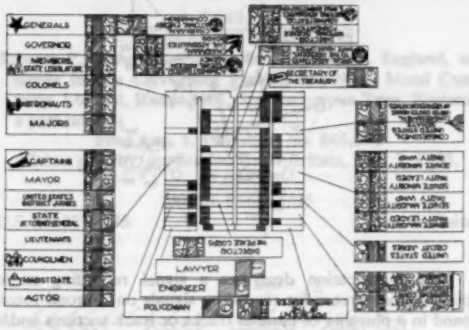
**3,643,958**
**GAME SIMULATING ASPECTS OF SOCIETY**
**Solomon Sperber, 34 Blackburn Road, Hillside, N.J.**
**Filed Feb. 29, 1968, Ser. No. 709,410**
**Int. Cl. A63f** *9/00*
**U.S. Cl. 273—134 AD** **9 Claims**




A game board, a first set of cards stating numbered issues, a recording set of cards, a second set of numbered cards stating laws, and having indicia identical to the issue numbers whereby one's opinion relating to the laws are correlated to the issues, a third set of cards stating cases and bearing indicia identical to the numbered issues and numbered law cards whereby one's opinions as to the cases are correlated to the laws and issues, a fourth set of cards allowing players to advance, and a set of chance cards stored in an used in conjunction with a game accessories container.

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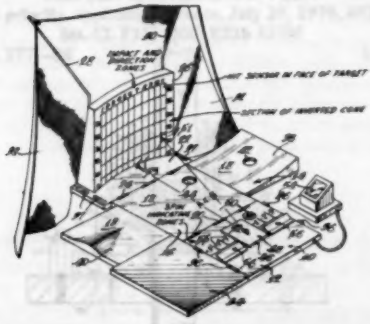
**3,643,959**
**GOLF GAME**
**William D. Cornell, Grand Haven; Martin M. Schankler, Muskegon, and Charles R. Kenrick, Grand Haven, all of Mich., assignors to Brunswick Corporation**
**Original application Apr. 13, 1966, Ser. No. 542,414, now Patent No. 3,523,689. Divided and this application Dec. 18, 1968, Ser. No. 807,148**
**Int. Cl. A63b** *67/02, 69/36*
**U.S. Cl. 273—176 FA** **10 Claims**



The invention is a device for measuring the flight characteristics of a golf ball hit in the ordinary manner by a golfer from a stationary tee against a prepositioned target. The self-healing target, positioned a known distance from the tee, temporarily records the initial direction of the hit within a directional indicating grid on the surface thereof. The target resembles a section of an inverted cone wherein all points thereon in a given horizontal plane are equidistant from the tee, and points in a higher plane are further from the tee. The target absorbs most but not all of the kinetic energy of the ball allowing it to rebound at a low velocity so as to roll along a level ball receiving surface located in front of the target to a spin detection device positioned thereon. Numbered zones on the directional indicating grid represent direction from the tee, and numbered (plus and minus) zones associated with the spin detection device indicate the relative effect of spin upon the shot. By algebraically adding the number of the zone where the ball impacts upon the target and the number of the spin detection zone to which the ball rolls after impact, the golfer obtains a number which designates the directional indicating zone on the target face indicating the direction of the terminal impact point of the ball. A microphone associated with the tee and an electrical sensing element associated with the target measures the approximate distance the hit ball would theoretically travel in the direction of its terminal impact point had it not been intercepted by the target.

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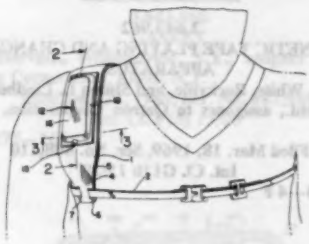
**3,643,960**
**CORRECT HEAD POSITION TRAINING DEVICE FOR GOLFERS**
**Edwin E. Gentilly, 14029 Gramatan Ave., Cleveland, Ohio**
**Filed Nov. 12, 1970, Ser. No. 88,124**
**Int. Cl. A63b** *69/36*
**U.S. Cl. 273—183 B** **4 Claims**




A training device adapted to teach a golfer to keep his head down during swings at the ball has a unitarily cast bellows with a whistle carried in a cavity formed in the lower wall thereof and operatively connected therewith. The bellows is fastened to the front part of a vertically disposed strap of foam-backed plastic that is adapted to be formed in inverted U shape to overlie a portion of the shoulder region of the golfer. The vertically disposed strap is held in place by a torso-encircling connecting strap passing under the arms of the golfer.

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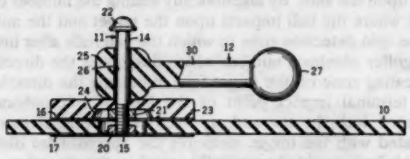
**3,643,961**
**GOLF-PRACTICING DEVICE**
**Arthur C. Schroeder, 730 Emerson Road, Creve Coeur, Mo.**
**Filed July 22, 1969, Ser. No. 843,626**
**Int. Cl. A63b** *69/36*
**U.S. Cl. 273—197 R** **2 Claims**

A golf-practicing device having a molded, integral driven member rotatively mounted on a substantially upright post attached to a resilient, flexible mat. The driven member includes a head portion rotatively mounted on the post, a ball portion at its free end which overlies the mat in spaced relation, and a rod portion interconnecting the head portion and ball portion and extending laterally at the post. The molded, integral driven member is constructed of a resilient material,

the head portion and ball portion being substantially the size of the conventional golf ball, and the interconnecting rod portion being of sufficient cross section to preclude permanent deformation when the ball portion is struck by a golf club. A spacer of resilient material is located on the post between the mat and the head portion of the driven member, the spacer providing a bearing for the rotative head portion and extending laterally of the post for a distance short of the ball portion. The spacer maintains the ball portion in spaced relation above the mat. The driven device is freely rotated on



the post when the ball portion is struck by the golf club.

In one embodiment a pair of rigid plates are provided one above and one below the mat, the post extending through the mat and secured to the rigid plate. This construction provides a unit that can be utilized both indoors and outdoors.

In another embodiment particularly suite for outdoor use, an elongate sleeve, constituting a socket, is inserted into the ground to provide a permanent anchorage. In usage, the post extends through the mat and into the socket to secure the mat to the ground.

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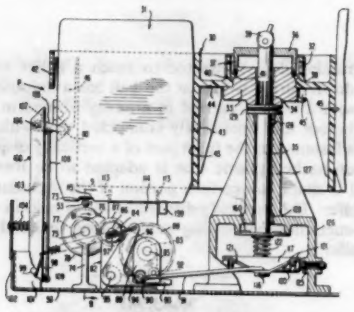
**3,643,962**

## MAGNETIC TAPE PLAYING AND CHANGING APPARATUS

**Rowland K. White, Rockville, and Simon L. Lindbeck, Bowie, both of Md., assignors to Qatron Corporation, Rockville, Md.**

**Filed Mar. 18, 1969, Ser. No. 808,110**
**Int. Cl. G11b *15/29***
**U.S. Cl. 274—4 F** **9 Claims**



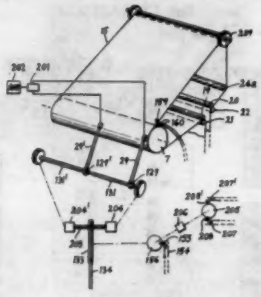
A plurality of tape cartridges are held in a rotary magazine. Mechanism is provided for indexing the magazine so as to move a particular cartridge to a play (or record) position. At the play position, the selected tape cartridge is shifted into engagement with a friction drive forming a part of the power train for indexing the magazine and shifting cartridges. A magnetic pickup (or record) head has an independent drive enabling the head to register with each of a plurality of tape channels. The entire apparatus is characterized by simplicity, compactness and economy as well as durability.

**3,643,963**

## SIGNAL RECORDING AND/OR PLAYBACK APPARATUS

**Jahangir Madjidi Ahy, 13 Duke St., Manchester Square, London, W. 1, England**

**Filed Apr. 28, 1969, Ser. No. 819,862**
**Claims priority, application Great Britain, Apr. 30, 1968, 20,507/68; 20,509/68**
**Int. Cl. G11b *5/00***
**U.S. Cl. 274—4 J** **9 Claims**



This specification describes a signal recording and/or playback apparatus for recording signals on a broad record band in a plurality of parallel tracks or track sections and/or for playing back signals so recorded. The apparatus described includes a transducer head which is driven across the record band in a series of steps, means being provided which ensure that each step corresponds to the spacing between two tracks or track sections. The apparatus described also includes a position indicator for indicating the position of the transducer head along the length of the band. This counter is reset to zero by means adapted to be actuated by trigger means provided on the band at a position corresponding to the ends of the tracks or track sections in which said signals are recorded or to be recorded. In a modification, two transducer heads are provided which are rendered operative during alternate periods, each of said heads being shifted to another track while it is inoperative.

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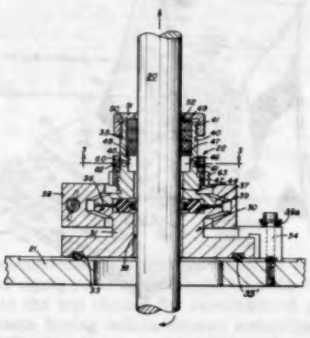
**3,643,964**

## PULL ROD SEAL

**Christopher Snelling, Penfield, and Anthony J. Gardone, Rochester, both of N.Y., assignors to Kayex Corporation, Rochester, N.Y.**

**Filed Oct. 12, 1970, Ser. No. 80,072**
**Int. Cl. F16j *15/10***
**U.S. Cl. 277—24** **14 Claims**



A seal is disclosed which permits a pull rod to be rotated and moved axially with respect thereto and which is provided

with a plurality of washers arranged in a stacked relation so that their engagement with the peripheral surface of the rod removes any oxide impurities therefrom and provides for deposition of the impurities into a chamber that is a part of the seal for the rod. The chamber is connected to the atmosphere through a series of radial holes and by a clearance hole surrounding the pull rod to the interior of the furnace. Consequently, the pressurized gas normally in the furnace moves or flows along the pull rod and into the chamber. The gas is still under sufficient pressure so that the impurities deposited in the chamber can be removed through the radial holes.

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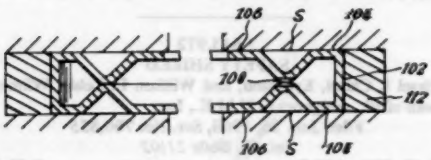
**3,643,965**
**SEALING MEANS**

**Terence P. Nicholson, Craigmiller, Stocksfield, England, assignor to The Corrugated Packing and Sheet Metal Company, Limited, Hamsterley, Newcastle upon Tyne, England, a part interest**

**Filed Aug. 1, 1969, Ser. No. 846,692**
**Claims priority, application Great Britain, Aug. 2, 1968, 37,018/68**
**Int. Cl. F16j** *15/08*
**U.S. Cl. 277—75** **8 Claims**




A sealing washer or gasket has a hollow section formed by walls which converge but leave at least one opening between the hollow section and the high-pressure side of the seal so that an increase in fluid pressure has the effect of urging the walls outwardly, thus tending to increase the sealing pressure with the surfaces between which it is located. Means are provided to prevent the opening being entirely closed by the normal pressures used to clamp the parts sealed by the washer or gasket. The outer periphery of the sealing washer or gasket, as seen in a section which includes the axis, is either generally straight or concave.

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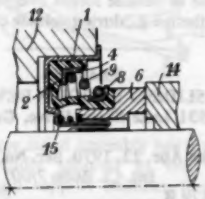
**3,643,966**
**SHAFT PACKING**

**Jean-Claude Bardet, Puteaux, France, assignor to Societe Internationale de Mecanique Industrielle S.A., Luxembourg**

**Filed June 8, 1970, Ser. No. 44,199**
**Claims priority, application France, July 29, 1970, 6925890**
**Int. Cl. F16j** *9/00;* **E21b** *33/00*
**U.S. Cl. 277—80** **1 Claim**




A shaft packing characterized in that it is capable of transmitting electric current, whether direct or alternating, from the fixed member to the rotary member; this possibility is particularly advantageous in case it is desired to control an electromagnetic device solid with the aforesaid rotary member.

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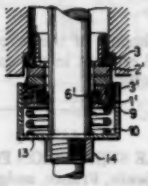
**3,643,967**
**SEALING RING FOR FACE SEALS**

**Filip Torvald Stahl, Alvsjo, Sweden, assignor to Stenberg-Flygt AB, Svetsarvagen, Solna, Sweden**

**Filed Feb. 4, 1969, Ser. No. 796,363**
**Claims priority, application Sweden, Feb. 16, 1968, 2081/68**
**Int. Cl. F16j** *15/34*
**U.S. Cl. 277—92** **3 Claims**




A sealing ring for face seals comprises a supporting ring, a hard material ring and a rubber ring bonded both to the supporting ring and to the hard material ring, the hard material ring and the rubber ring being bonded to one side of the supporting ring whereby the supporting ring is capable of dissipating the heat of friction. The supporting ring has a substantially L cross-sectional shape and the hard material ring can be either ceramic or sintered carbide.

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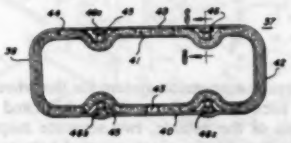
**3,643,968**
**GASKET**

**Guy E. Horvath, Williamsville, N.Y., assignor to Hercules Packing Corporation, Alden, N.Y.**

**Filed Dec. 24, 1969, Ser. No. 887,988**
**Int. Cl. F16j** *15/00*
**U.S. Cl. 277—166** **10 Claims**




A gasket comprising in combination an elastomeric member and a resilient support member of sidewalls spaced from each other and a bottom wall joining such sidewalls at lower positions thereof and together with such sidewalls defining a cavity in which the elastomeric member is maintained in a supportive arrangement.

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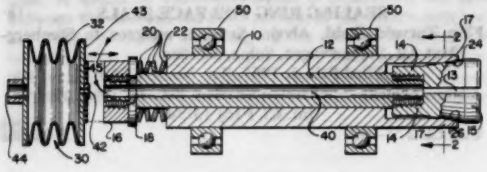
**3,643,969**
**PLUNGER OPERATED ROTATABLE COLLET**

**Robert L. Finley, Norfolk, and Raymond E. Sansom, New Milford, both of Conn., assignors to Diventco, Inc., New Milford, Conn.**

**Filed Jan. 12, 1970, Ser. No. 2,428**
**Int. Cl. B23b** *31/30*
**U.S. Cl. 279—4** **16 Claims**

A machine tool spindle characterized by excellent dynamic balance at very high rates of rotation and adapted for automatic tool changing has a tool-holding collet actuated by a plunger coaxial with the spindle. The plunger is maintained in the tool-holding position by belleville springs that rotate with the plunger and collet and a nonrotating push rod en-

gages the plunger and drives it against the spring bias to open the collet when a tool is to be released or picked up. Advantageous embodiments of the invention, the collet draws air through a small conduit in the spindle, thereby cleaning dust from the collet fixture.



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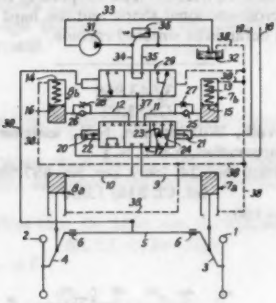
**3,643,970**
**LOCKABLE SUSPENSION FOR VEHICLES**

**Yves M. Gauchet, Senlis, France, assignor to Societe Anonyme Poclain**

**Filed May 12, 1970, Ser. No. 36,551**
Claims priority, application France, May 14, 2069, 6915773
**Int. Cl. B60g** *17/00*
**U.S. Cl. 280—124 F** **4 Claims**



In an hydraulic suspension system for the wheels of an axle of a vehicle such as a public works machine and with respect to the chassis of the vehicle, two separate suspension arms articulated to the chassis, a jack coupled between the chassis and each of the suspension arms, a resilient member arranged in the chamber of each jack wherein the resilient member is capable of being compressed by hydraulic fluid feeding the jack, a conduit connecting the chambers of the two jacks, and selective isolating means arranged between the chamber and on the conduit connecting the chambers of the two jacks, whereby the suppleness of each of the suspension arms is adjustable for road travel of the vehicle and the suspension arms are lockable for stability of the vehicle at a worksite.

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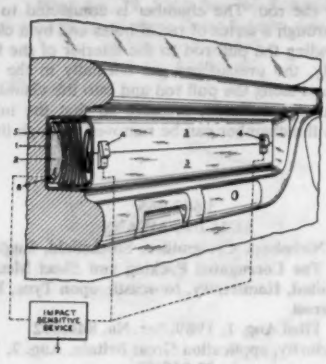
**3,643,971**
**SELF-INFLATING IMPACT-ABSORBING BAG FOR VEHICLES**

**Julian H. Kushnick, Brooklyn, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.**

**Filed Aug. 11, 1970, Ser. No. 63,196**
**Int. Cl. B60r** *21/10*
**U.S. Cl. 280—150 AB** **13 Claims**

A vehicle safety device having normally contracted protective bags installed in a vehicle at convenient locations and which is adapted so that upon the occurrence of a collision of the vehicle a noninflammable gas generating medium produces and delivers a gas into the protective bags to inflate them, thus providing shock-absorbing cushions between passengers or other objects and rigid vehicle parts.



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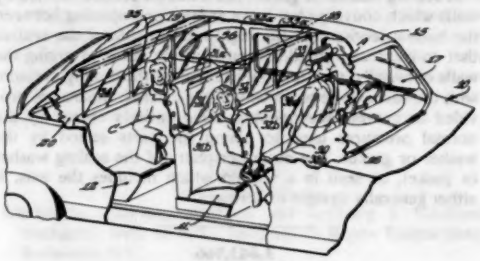
**3,643,972**
**SAFETY SHIELD**

**Michael I. Caiati, Evanston, and William L. Lehle, Wilmette, both of Ill., assignors to H.M.K., Inc.**

**Filed Jan. 26, 1968, Ser. No. 700,855**
**Int. Cl. B60r** *21/02*
**U.S. Cl. 280—150 B** **8 Claims**



Injury to passengers in vehicles from either collision with hard surfaces and/or quick whiplash movement of the body is prevented by a safety shield comprising a yieldable, flexible transparent material removably mounted along at least two opposite edges and held taut to provide a shock-absorbing barrier between the person to be protected and the direction of movement of his person particularly in times where the movement is due to outside forces overpowering the persons ability to resist them e.g., during vehicle collisions.

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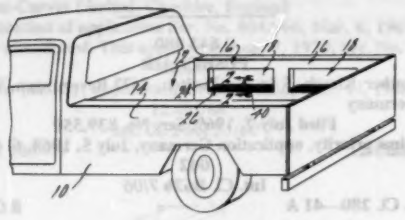
**3,643,973**
**SLIDING TIEDOWN DEVICE**

**John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich.**

**Filed Apr. 22, 1970, Ser. No. 30,665**
**Int. Cl. B60p** *7/00*
**U.S. Cl. 280—179 R** **3 Claims**

A slidable tiedown device for an automobile vehicle such as a pickup truck. A pair of channel members are mounted on the sidewalls of the truck bed and serve as mounts for one or more pairs of tiedown members. The tiedown members

are slidable along the length of the channel members and may be locked in any desired position thereon by an internally threaded collar, nut or the like. The tiedown members have eyelet openings adapted to receive a rope or the like.



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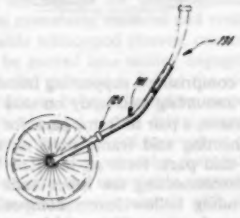
**3,643,974**
**BICYCLE FORK EXTENSION**
**Norman T. Peate, 5951 East 18th St., Tucson, Ariz.**
**Filed Apr. 3, 1970, Ser. No. 25,459**
**Int. Cl. B62k 21/02**
**U.S. Cl. 280—278** **1 Claim**



The present invention comprises a dragster rail or bicycle fork extension adapted to either nonmotorized or motorized bicycles, the respective elements of which are stabilized against misplacement by a yoke member.

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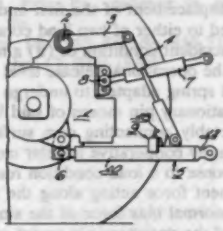
**3,643,975**
**RETRACTABLE TONGUE STAND FOR TRAILERS**
**William R. Parkhurst, Sedalia, Mo., assignor to Parkhurst Manufacturing Co., Inc., Sedalia, Mo.**
**Filed Feb. 3, 1970, Ser. No. 8,276**
**Int. Cl. B60s 9/02**
**U.S. Cl. 280—475** **2 Claims**

A retractable tongue stand assembly has a pair of spaced, depending plates rigidly secured to the tongue which pivotally carry a rigid support member therebetween for swinging movement between retracted and extended positions. A spring-loaded latch is shiftable along a longitudinal track on the member into locking engagement with sets of notches on the plates to releasably lock the member in either its retracted or extended positions.

**3,643,976**
**LATCH FOR DRAFT ARM EXTENSION**
**Robert C. Haupt, Milwaukee, and Donald E. Peterson, Wauwatosa, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.**
**Filed Oct. 19, 1970, Ser. No. 81,863**
**Int. Cl. B60d 1/00**
**U.S. Cl. 280—478 R** **10 Claims**



An extendible draft arm including an extendible member telescoping in a base member with a latch to retain the draft arm in its retracted position.

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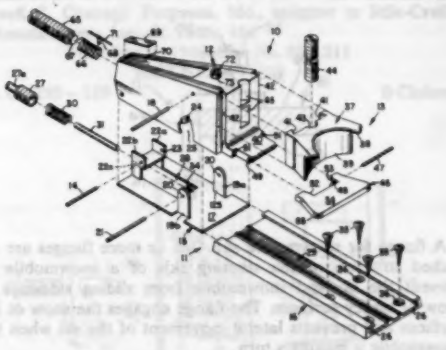
**3,643,977**
**SKI BOOT HEEL BINDING**
**Bernard E. Berlenbach, Mill Valley, Calif., assignor to Ski Free Company, Mill Valley, Calif. and M. A. Miller Manufacturing Co.**
**Filed July 23, 1970, Ser. No. 57,696**
**Int. Cl. A63c 9/08**
**U.S. Cl. 280—11.35 T** **23 Claims**



In a heel binding of the type having elongated body member having a forward heel boot holding means, a body member swingable relative to a base member about a rearward horizontal pivot axis substantially perpendicular to the axis of the ski runner substantially parallel to the top face of the runner, whereby the heel boot holding means is pivoted from a holding position in which the heel holding means is substantially abutting the top face of the runner, to a release position in which this heel holding means is raised from and inclined relative to the top face of the runner, the improvement including: (a) a single coil spring carried by one of the body members and the base member operating along a zone of action; (b) a V-frame connecting means positioned intermediate the rearward pivot axis of the binding and the heel-holding means in operative contact with the single coil spring, and including first and second leg means carrying cooperative broad-contacting, complementary surface means at their swingably engaging surfaces to each other, one of the

leg means also carrying thereto a substantially disconnectably connecting L-shaped cam surface aligned with the zone of action of the spring; (c) linking means for connecting the first and second leg means to the body member and the base member, respectively, a pair of horizontal pivot axes, and including a stationary pin means disconnectably positioned with respect to the disconnectably connecting L-shaped cam surface on the one leg means to normally prevent pivotal tilting of the body member relative to the base member, but being adapted to release from said cam surface allowing relative angular displacement of the first and second leg means when subjected to either of two load conditions corresponding to (i) an accident condition or (ii) a manual release condition above the operational release level of the binding; (d) the single coil spring adapted to undergo axial movement to release the stationary pin means of said linking means from the disconnectably connecting cam surface carried on the one leg means, by cooperative angular movement of said leg means in response to a load condition resolvable into an antibias component force acting along the zone of action opposite to the normal bias force of the single coil spring; (e) after release of the stationary pin means of the linking means from the cam surface, continued depthwise displacement of the horizontal pivot axis being aided, at least in part, by the normal bias force of the single coil spring until the release position of the heel-holding means is achieved, after the release position is attained and the load condition acting on the binding is terminated, the release position being maintained by the normal bias force of the single coil spring.

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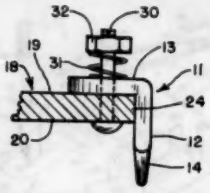
**3,643,978**

## SKI FLANGE

**Russell C. Westberg, 10342 Pleasant Ave. S., Bloomington, Mich.**

**Filed Dec. 9, 1969, Ser. No. 883,428**
**Int. Cl. B62b *17/00***
**U.S. Cl. 280—28** **1 Claim**




A flange for snowmobile ski. One or more flanges are attached to each of the steering skis of a snowmobile to prevent the ski and snowmobile from sliding sideways in snow or on icy surfaces. The flange engages the snow or icy surfaces and prevents lateral movement of the ski when the snowmobile is making a turn.

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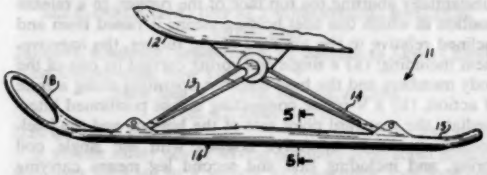
**3,643,979**

## SNOWMOBILE SKI CONSTRUCTION

**William R. Richards, Roseau, Minn., assignor to Textron Inc., Providence, R.I.**

**Filed Dec. 15, 1969, Ser. No. 885,091**
**Int. Cl. B62b *17/02***
**U.S. Cl. 280—28** **3 Claims**




The disclosure is directed to a snowmobile ski of laminated construction, having an abrasion-resistant outer skin and an inner polyurethane fill bonded to the outer skin. An arcuate metal rod runs along the midline of the ski, bowing from the bottom surface of the ski to provide an abrasion-resistant runner to enhance control of the vehicle.

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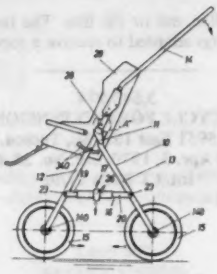
**3,643,980**

## PUSHCHAIR

**Guenther Kirsch, 5 In der Poelten, 3472 Beverungen, Weser, Germany**

**Filed July 7, 1969, Ser. No. 839,550**
**Claims priority, application Germany, July 5, 1968, G 67 51 042**
**Int. Cl. B62b *7/06***
**U.S. Cl. 280—41 A** **8 Claims**



A pushchair comprising a supporting frame, a body, means for detachably mounting said body on said frame, a pair of sides for said frame, a pair of frame parts for each said side, a pivot interconnecting said frame parts so that at least the lower ends of said parts form an inverted V, an extensible spring unit interconnecting the lower ends of said parts, a pair of coextending hollow levers composing said unit, at least one tensioned spring within said levers, and a bendable joint between said levers.

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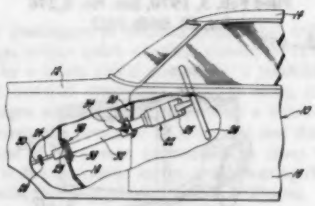
**3,643,981**

## STEERING COLUMN ASSEMBLY SUPPORT

**Leonard F. Grandel, Carrollton; Floyd A. Schluckebier, Frankenmuth, and Dan R. Kimberlin, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 30, 1970, Ser. No. 33,234**
**Int. Cl. B62d *1/18***
**U.S. Cl. 280—87 R** **3 Claims**



A vehicle steering column assembly is engaged by a support arrangement intermediate the ends thereof which generally rigidly connects a portion of the column assembly to the vehicle body but which is permanently deformable upon relative displacement between the column assembly and vehicle body and thereafter again rigidly supports the column assembly in the displaced position and without exerting thereon substantial restoring forces, the support arrangement including a support member having inner and outer rings attached respectively to the column assembly and vehicle body and interconnected by a plurality of permanently deformable webs the thickness and configuration of which determine the strength of the support member.

3,643,982

## DUST SEALING MECHANISMS FOR HOPPERS OR THE LIKE

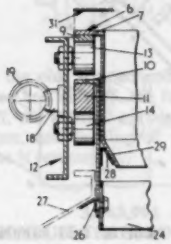
Arthur Douglas Murphy, Bramhall, England, assignor to Simon-Carves Limited, Cheshire, England

Continuation of application Ser. No. 804,966, Mar. 6, 1969, now abandoned. This application Aug. 7, 1970, Ser. No. 62,149

Claims priority, application Great Britain, Mar. 14, 1968, 12,402/68

Int. Cl. F16l *25/00*

U.S. Cl. 285—9 12 Claims



A dust sealing mechanism for use in association with a receptacle for dust containing material and comprising a pair of relatively movable telescoped sleeves, one of said sleeves being adapted to be moved into sealing engagement with an outlet from which the material is fed to the receptacle, and the other of said sleeves being adapted to cooperate with an inlet in the receptacle, and means interconnecting the two sleeves for effecting opposite axial movement of the sleeves into their operative position whereby material can be fed through the sleeves into the receptacle comprising a rotatable ring having camming engagement with the respective sleeves.

3,643,983

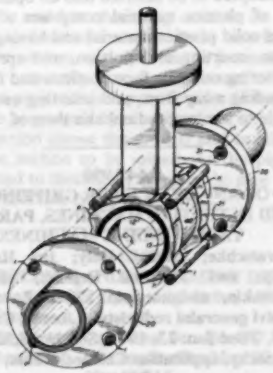
## DEVICES FOR AXIAL ALIGNMENT OF PIPE OR OTHER FLANGES

Edwin H. Ludeman, Red Bank, N.J., assignor to Andrews Industries, Dayton, N.J.

Filed Nov. 21, 1969, Ser. No. 878,765

Int. Cl. F16l *23/00*

U.S. Cl. 285—31 3 Claims



Devices are described which are adapted to be positioned between a pair of plain faced pipe or other flanges having a plurality of evenly spaced, oversize bolt holes to receive a like number of bolts to hold the flanges together. The devices are provided with a plurality of camming surfaces adapted to bear against the bolts and force them into a limiting position of their radial travel permitted by the clearance of the oversize bolt holes around the bolts, thus axially aligning the flanges.

3,643,984

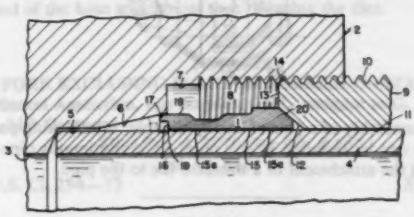
## PLASTIC COATED FERRULE FOR A TUBE COUPLING

Bernard J. Bucceri, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Sept. 10, 1969, Ser. No. 856,711

Int. Cl. F16l *19/08*

U.S. Cl. 285—94 3 Claims



A plastic coated, positive-bite-type ferrule for a high-pressure tube coupling including cooperating body and closure members which engage the plastic coated ferrule therebetween to seal the coupling.

3,643,985

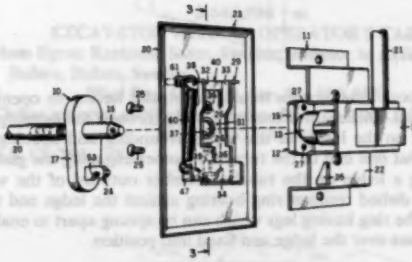
## LATCHING DEVICE FOR COUPLING ASSEMBLY

Bidwell C. Cranage, Ferguson, Mo., assignor to Stile-Craft Manufacturers, Inc., St. Louis, Mo.

Filed Dec. 4, 1969, Ser. No. 882,211

Int. Cl. F16l *41/00*

U.S. Cl. 285—189 8 Claims



This latching device is used to couple connectable members together, one of which includes an adapter assembly having a valve plug, and the other of which includes a valve assembly having a valve plug receiving body. The adapter assembly includes an offset latch plug, and the valve assembly includes a latching unit engageable with the latch plug. The latching unit includes a slotted bracket member and an independent latch frame member capable of guided movement within the slots. A tension spring between these two members tends to pull them together. The latch plug includes a cammed nose portion and a transverse latch slot. The latch frame includes a cammed lip deflected by cam action and received into the latch slot to provide the latched condition. Unlatching is effectuated by depressing the latch frame.

3,643,986

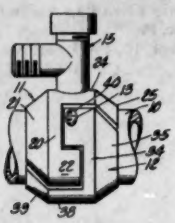
## PIPELINE SADDLE ASSEMBLY

Donald R. Allan, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of application Ser. No. 644,291, June 7, 1967, now abandoned. This application Dec. 15, 1969, Ser. No. 882,358

Int. Cl. F16l 41/04

U.S. Cl. 285—197 15 Claims



An assembly of a pair of axially slidable, interlocking parts which can be installed at any point on a continuous pipe to permit the attachment of a standard tee to the pipe.

3,643,987

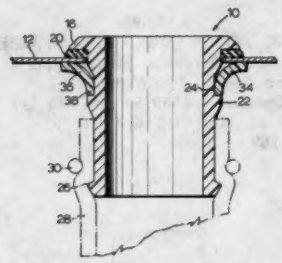
## SPOUT STRUCTURE

Ronal Charles DuPont, London, Ontario, Canada, assignor to GSW Limited-GSW Limitee, Toronto, Ontario, Canada

Filed Sept. 11, 1970, Ser. No. 71,325

Int. Cl. F16l 5/00

U.S. Cl. 285—205 2 Claims



A spout structure for liquid receptacles having an opening in a wall consists of a tube extending through the opening, a gasket on the inside of the wall surrounding said opening, a flange at one end of the tubular member engaging the gasket having a ledge on the tubular member outward of the wall and a dished resilient ring bearing against the ledge and the wall, the ring having legs which can be sprung apart to enable it to pass over the ledge and fixed into position.

3,643,988

## RELEASABLE CORNER JOINT ARRANGEMENT FOR STACKING FRAMES FOR LOADING PALLETS

Arne Ingvartsen, Bubbel, 5592 Ejby, Denmark

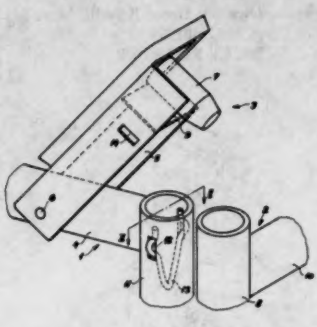
Filed Nov. 18, 1969, Ser. No. 877,758

Claims priority, application Denmark, Nov. 27, 1968, 5794/68

Int. Cl. F16b 2/04, 7/04

U.S. Cl. 287—53.5 1 Claim

This invention relates to a releasable corner joint for a stacking frame with detachable side members for a loading pallet. The detachable side members of such a stacking frame normally comprises two tubular outer posts held together by means of a girder, and are interconnected by means of a corner joint being formed as a U-shaped fitting pivotally connected to the girder so that its downwardly facing flanges in the locked position grip and hold the girder. The joint may further be provided with a gib member adapted to be introduced into one tubular side post of an adjacent side member. In accordance with the present invention the side post of the said side member supporting the joint is provided with a resilient locking member projecting through one or



two apertures in the wall of said tubular side post and adapted to cooperate with a recess in one or in both flanges of the said U-shaped joint, whereby easy handling and proper function is secured.

3,643,989

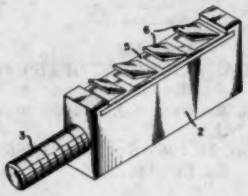
## DOWEL FOR EXTRUDED SECTIONS OF PLASTICS MATERIAL

Erich Sattler, Wildbad (Bundesrepublik Deutschland), Sommerberg, Germany

Filed Oct. 29, 1969, Ser. No. 870,227

Int. Cl. F16b 7/16

U.S. Cl. 287—189.36H 1 Claim



A dowel adapted to be inserted into an open end of a tubular section of plastics material comprises a prismatic plug consisting of solid plastics material and having side face portions and an inserting end portion, and spring sheet steel means contacting said side face portions and formed with lug means extending away from said inserting end portion at an oblique angle to the longitudinal axis thereof.

3,643,990

## METHOD OF AND DEVICE FOR GRIPPING A MOVING YARN END IN TEXTILE MACHINES, PARTICULARLY YARN WINDING MACHINES

Rudolf Horatschke; Zdenek Holy; Jiri Havlas; Premysl Kostelecky, and Vlastimil Rejnart, all of Liberec, Czechoslovakia, assignors to Elitex Zavodny textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia

Filed Jan. 23, 1970, Ser. No. 5,334

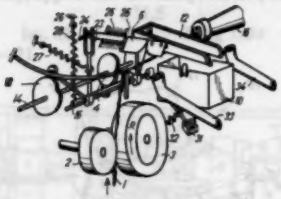
Claims priority, application Czechoslovakia, Feb. 7, 1969, 821/69

Int. Cl. A01d 59/04

U.S. Cl. 289—1.5 10 Claims

A method of and an apparatus for gripping a moving yarn end in textile machines, particularly yarn winding machines

having yarn storage magazines which are impositively fed by driven pinch rolls. Upon the breakage of or exhaustion of yarn, the yarn end is automatically gripped in a novel manner. Thereafter, a new yarn end is fed into the apparatus



where it meets the old, gripped end in a knotter. After the two ends are tied and knotted, the free ends of the two yarn ends are cut off, the knotted portion of the yarn is released from the knotter, and feeding of the yarn into the yarn storage magazine is resumed.

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3,643,991

## CONDUIT THREADING TOOL

Jack Eaton, Gleason, Wis., assignor to Van Ert Electric, Rudolph, Wis.

Filed June 1, 1970, Ser. No. 42,005
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 4 Claims

A tool to be used in threading conduit or pipe section together. The tool includes a roller to be inserted in the free end of the pipe section, and the roller is journaled on a shaft which extends outwardly from the lower end of a column. A pair of handles project from opposite sides of the column and are adapted to be grasped by a workman to hold the free end of the pipe section above the ground and in alignment with the other pipe section to be joined. As the pipe section is manually rotated to threadedly connect the pipe sections, the pipe section will rotate freely on the roller.

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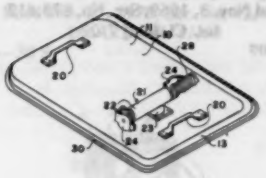
3,643,992

## TILE HOLDING AND PLACEMENT DEVICE

Romeo Jacobucci, 337 Lynbrook Drive, Winnipeg 20, Manitoba, Canada

Continuation-in-part of application Ser. No. 847,065, Aug. 4, 1969, now abandoned. This application May 27, 1970, Ser. No. 40,915
Int. Cl. B66c *1/02*
U.S. Cl. 294—65 4 Claims

A rectangular casing having a planar rubber facing apertured and communicating with the interior of the casing. A hose attachment on the back of the casing enables a vacuum hose to be attached thus transferring suction to the apertures.



When the tiles are placed in position on the wall by the device, the vacuum is broken by releasing a cap on the other end of the hose attachment thus releasing the tiles.

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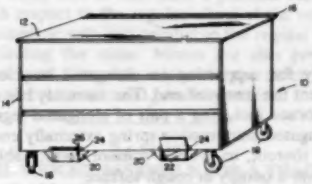
3,643,993

## FORK EXCLUDING FLAP FOR RUBBISH CONTAINER

Manuel Asadurian, Los Angeles, Calif., assignor to G. I. Rubbish Company

Filed Feb. 4, 1970, Ser. No. 8,662
Int. Cl. B65f *1/00*
U.S. Cl. 294—73 3 Claims



An improved container for refuse collection, which is adapted to be lifted and dumped by an appropriate elevating mechanism, is provided with a flap assembly on the supporting channels to prevent entry of lifting forks from the "wrong" side.

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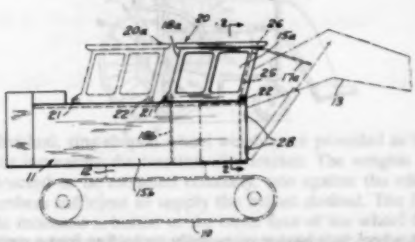
3,643,994

## EXCAVATOR WITH AN OPERATOR'S CAB

Hans Egron Karlsson, Sater, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 10, 1969, Ser. No. 883,855
Claims priority, application Sweden, Dec. 12, 1968, 17058/68
Int. Cl. B62d *33/06*
U.S. Cl. 296—28 C 4 Claims



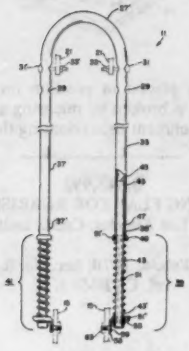
An excavator with an operator's cab which includes a cap which is displaceable from a forward end position in which it sealingly engages the front wall of the cab, to any desired rear position to expose a corresponding portion of the cab to the surrounding atmosphere for ventilating the cab.

3,643,995

## SADDLE SUPPORT MEANS

Maurice E. Rich, Jr., Memphis, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.

Filed Nov. 3, 1969, Ser. No. 873,412
Int. Cl. B62j 1/02
U.S. Cl. 297—209 13 Claims



Assembly for supporting an elongated bicycle saddle or seat adjacent the rearward end. The assembly has an inverted U-shaped brace including a pair of elongated legs each having an elongated compression spring externally encircling the lower end thereof, to provide a more comfortable ride particularly over a bumpy or rough surface.

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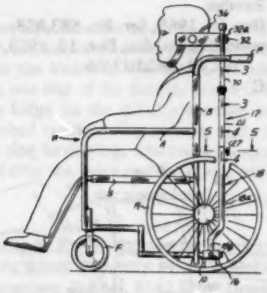
3,643,996

## HEADREST APPARATUS FOR A WHEELCHAIR

William Carnahan, 2158 South M-47, Owosso, Mich.

Filed Feb. 27, 1970, Ser. No. 14,977
Int. Cl. A47c 7/36, 7/42
U.S. Cl. 297—410 9 Claims



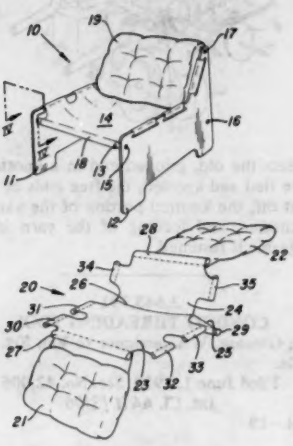
A wheelchair having rearwardly projecting frame members on which headrest apparatus is adjustably mounted for movements vertically and horizontally to accommodate patients of varying physiques. Mounting apparatus is provided to permit the headrest apparatus to swing in a horizontal plane and includes a swivel, and mechanism for selectively restricting the movement of the swivel.

3,643,997

## SEATING UNIT AND WEB THEREFOR

Stuart John Gilbert, and Karen T. Gilbert, both of Constantine, Mich., assignors to Harter Corporation, Sturgis, Mich.

Filed June 4, 1970, Ser. No. 43,407
Int. Cl. A47c 4/02, 7/14
U.S. Cl. 297—441 10 Claims



A knockdown-type seating unit comprises a pair of spaced, upwardly extending side panels, three horizontally spaced cross braces detachably secured between said side panels and together defining a seating frame, and an articulated web draped over said seating frame and held captive by said cross braces.

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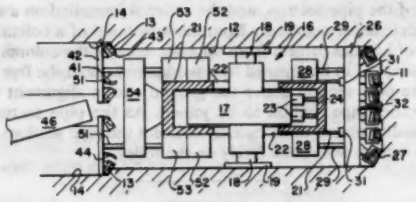
3,643,998

## TUNNELING MACHINE FOR NONCIRCULAR BORES

Thomas N. Williamson, San Mateo, Calif., assignor to Jacobs Associates, San Francisco, Calif., a part interest

Filed Apr. 20, 1970, Ser. No. 29,998
Int. Cl. E01g 3/04
U.S. Cl. 299—31 4 Claims



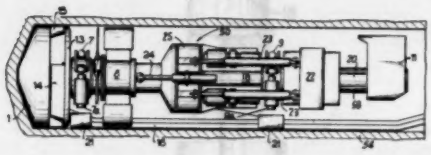
To bore a noncircular hole a conventional tunneling machine is provided with two or more rotatable cutter wheels mounted at the rear of the machine and rotating about axes parallel, but offset relative to, the main boring head of the machine. The main boring head digs the conventional circular bore. The rear-mounted wheels advance with the machine and dig into the circular bore to form the desired cross-sectional shape–D–or horseshoe-shape, etc.

3,643,999

## TUNNEL DRIVING MACHINE

Gerd Kampf-Emden, Hosel; Heinz Horst, and Friedrich Klapdohr, both of Rheinhausen, all of Germany, assignors to Demag A.G., Duisburg, Germany

Filed Oct. 31, 1969, Ser. No. 872,808
Claims priority, application Germany, Nov. 9, 1968, P 18 07 971.5
Int. Cl. E21c *29/02*; E01g *3/04*
U.S. Cl. 299—31 6 Claims



A tunnel driving machine includes an elongated machine frame having a central large frame portion accommodating a tunnel tool driving gearing and the associated driving motors and a forwardly extending and rearwardly extending tubular frame portion. The forwardly extending portion accommodates the main shaft for the forward driving tool and it is supported on front bracing in a manner permitting its longitudinal shifting movement relative to the bracing. A rearwardly extending tubular portion is supported in rear bracing which permits a longitudinal shifting movement. In addition to the front and rear bracing, there is a front support and a rear support for the tubular frame which may be selectively engaged with the tunnel wall during the times at which the front and rear bracing are removed from tunnel-wall engagement and shifted longitudinally. The construction includes driving motors connected between the main frame and the front bracing and main bracing and the rear bracing for facilitating advancing movement of each bracing element within the tunnel during those times at which the frame is supported on the front and rear supports.

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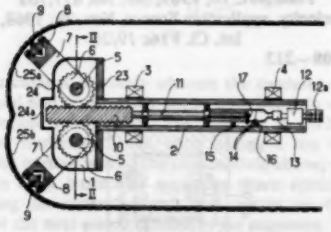
3,644,000

## TOOL HAVING A SWEEPING MOVEMENT FOR CONTINUOUS BORING OR CUTTING MACHINE

Marcel Montacie, Paris, France, assignor to Union Industrielle Blanzy-Quest, Paris, France

Filed Feb. 17, 1970, Ser. No. 11,992
Claims priority, application France, Feb. 17, 1969, 6903893
Int. Cl. E21c *27/24*
U.S. Cl. 299—86 5 Claims



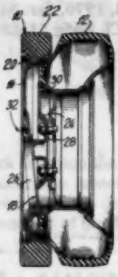
A tool for a rotating head of a continuous boring or cutting machine wherein the tools are mounted in pairs and are symmetrically arranged in relation to the axis of the rotating head and are caused to oscillate automatically in a radial direction by a rack and pinion drive mechanism operated by a double-action hydraulic jack means powered by an automatically controlled electrically driven hydraulic pump, wherein the movement of each pair of tools is synchronized and operate in opposite directions to each other to thereby provide dynamic and static balancing of the rotating head to perform a continuous boring or cutting operation.

3,644,001

## EMERGENCY WHEEL

Robert Lavallee, 2131 Chapdelaine Apt. 10, Quebec, 10 Quebec, Canada

Filed Feb. 17, 1970, Ser. No. 12,100
Int. Cl. B60b *11/00*
U.S. Cl. 301—38 S 13 Claims



An emergency wheel comprising an outer disc carrying a tire and an inner disc adapted for concentric attachment to the regular wheel of a vehicle. Both discs are rotatably joined by eccentrically and obliquely disposed mating portions, causing the outer disc to shift from a position eccentric and oblique with respect to the regular wheel of the vehicle, to a position concentric with and parallel to the regular wheel and closely encircling the same. Means are also provided for securing the inner disc with respect to the outer disc when shifted to such concentric and parallel position.

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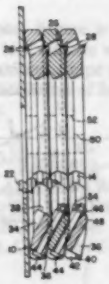
3,644,002

## WHEEL WEIGHT ASSEMBLY FOR A TRACTOR

Hubert Barth, Mannheim, and Klaus Hauk, Altrip, Ludwigshafen, both of Germany, assignors to Deere & Company, Moline, Ill.

Filed Aug. 12, 1970, Ser. No. 63,093
Claims priority, application Germany, Aug. 20, 1969, P 19 42 315.5
Int. Cl. B60b *15/28*
U.S. Cl. 301—41 W 15 Claims



Individual, ring-shaped wheel weights are provided as ballast for increasing the traction of a tractor. The weights are constructed to be mounted coaxially, one against the other, in numbers sufficient to supply the ballast desired. The first weight mounted is bolted to the outer face of the wheel disc and the weights added thereafter are secured in succession only to the adjacent previously mounted weight. The connection between the adjacent weights is effected by a pair of interengaged hook and shoulder connection parts in cooperation with a bolt which is inserted into and held by a nut in an opening formed by cooperating, U-shaped grooves in the adjacent weights. The hooks, shoulders and grooves are so

disposed relative to each other that by tightening the nut on the bolt the hooks of the weight being mounted become tightly engaged with the shoulders of the adjacent mounted weight.

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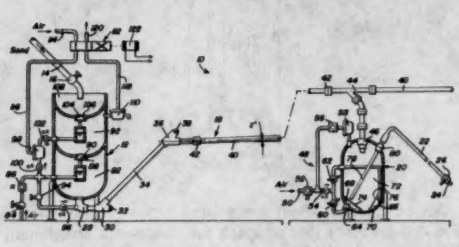
3,644,003

## PNEUMATIC PRESSURE CONVEYING SYSTEM

Irwin Von Funk, P.O. Box 157, Macungie, Pa.

Filed Jan. 12, 1970, Ser. No. 2,064
Int. Cl. B65g *53/40*
U.S. Cl. 302—53 14 Claims



A conveying conduit is maintained completely filled with dry sand by an air pressurized supply from a refill vessel. The sand is transferred by the conduit to one or more dispensing vessels maintained at a substantially lower pressure than the conveying conduit. The sand is fluidized and selectively discharged from the dispensing vessel under this substantially lower pressure while the sand in the conduit is maintained pressurized when flowing as well as in a static condition when discharge from the dispensing vessel is stopped.

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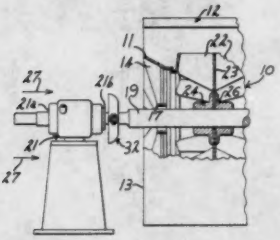
3,644,004

## MEANS TO PREVENT LUBRICANT FROM BEING FORCED OUT OF BEARINGS AND THE LIKE

Alton E. Hand, Birmingham, Ala., assignor to Zurn Industries, Inc.

Filed Aug. 18, 1970, Ser. No. 64,785
Int. Cl. F16c *33/72*
U.S. Cl. 308—36.3 2 Claims



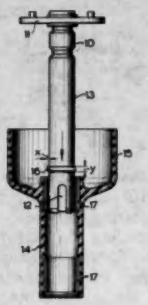
Means to prevent lubricant from being forced out of shaft supported bearings and the like when the bearing is subjected to differential in pressure at opposite ends. The pressure against the downstream end or face of the bearing is increased by reversely directing some of the air flowing axially of the bearing against the downstream end thereof, thus in part equalizing pressure at both ends, preventing lubricant from being drawn through the bearing.

3,644,005

## METHOD OF MAKING JOURNAL CONSTRUCTIONS

Karl-Heinz Schneider, Sonthofen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 28, 1970, Ser. No. 6,511
Claims priority, application Germany, Jan. 29, 1969, P 19 04 275.2
Int. Cl. F16c *29/12*
U.S. Cl. 308—37 5 Claims



A tubular journal member of predetermined inner diameter and composed of material having a predetermined elasticity is provided. An element to be journaled in the journal member has an outer circumferential surface of a given diameter and at least one circumferential bead projecting from the surface by a predetermined amount. The bead is inserted through the journal member and the diameters, the predetermined amount of projection and the elasticity of the material of the journal member are so correlated that insertion of the bead through the journal member effects calibration of the inner diameter of the latter with the material of the journal member elastically yielding to the bead and thereupon returning to define with the outer circumferential surface a predetermined amount of play.

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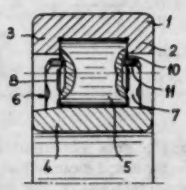
3,644,006

## CAGES FOR ROLLER-BEARINGS

Pierre Feuillat, and Joseph Lyard, both of Annecy, France, assignors to Societe Nouvelle de Roulements, Annecy (Haute Savole), France

Filed Nov. 18, 1969, Ser. No. 877,782
Claims priority, application France, Nov. 20, 1968, 174606
Int. Cl. F16c *19/26*
U.S. Cl. 308—213 1 Claim



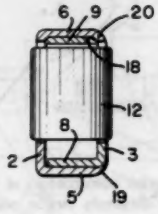
This cage, separator or retainer for roller-bearings consists of a one-piece envelope and the rollers are retained, in the absence of one of the bearing races, by bosses formed in said cage and engaging adequate cavities centered at each end of the rollers.

3,644,007

## HIGH-SPEED ROLLER THRUST BEARING

Richard L. Alling, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed July 29, 1970, Ser. No. 59,097
Int. Cl. F16c 33/64
U.S. Cl. 308—235 5 Claims



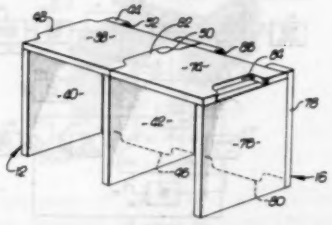

A roller thrust bearing including a cage composed of a pair of C-shaped cage members which have slotted faces and pairs of lips extending at right angles from the faces. The two cage members fit together with their lips overlapped and their faces spaced in parallel relationship with a group of bearing rollers having substantially flat ends housed in the cage and seated in the face slots. The face slots are extended radially outward far enough for the outer ends of the rollers to seat on the lips at the outer periphery of the cage without interferring with the rollers.

3,644,008

## MODULAR CABINET CONSTRUCTION

Robert R. Overby, 4721 Clinton St., Los Angeles, Calif.

Filed May 11, 1970, Ser. No. 36,001
Int. Cl. A47b 87/02
U.S. Cl. 312—107 14 Claims




Modular cabinet assembly wherein the modules are vertically stacked and horizontally sequenced, being in wall sharing, interlocked relationship. The modules in each vertical stack share horizontal walls, each having a top wall that serves as the bottom wall of the next module above; while the modules in each horizontal sequence share vertical walls, each having an outer sidewall that serves as the inner sidewall for the next added module in the sequence.

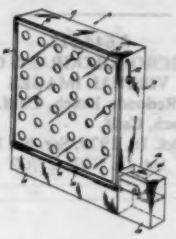
3,644,009

## DISPLAY RACK FOR TAPE CARTRIDGES

Henry W. Tyler, 7112 Wilshire Blvd., Des Moines, Iowa

Filed July 28, 1970, Ser. No. 58,831
Int. Cl. A47f 3/00
U.S. Cl. 312—117 4 Claims

A compartmented display rack for tape cartridges which includes a transparent barrier or door through which the cartridges can be viewed. The door is suitably spaced from the tape compartments and includes a plurality of openings through which a viewer can extend his hands for removing individual tapes from the compartments for inspection but with the openings being of a size that will not permit the tapes to be passed therethrough. A conveyor is disposed at



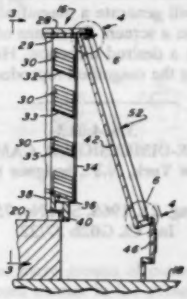
the bottom of the rack between the barrier and the compartments so that any cartridge selected for purchase can be deposited on the conveyor which delivers the same to a point of deposit under the control of the store management.

3,644,010

## TAPE CASSETTE DISPLAY FIXTURE

John F. Murphy, Allentown, Pa., assignor to Hess's of Allentown, Inc., Allentown, Pa.

Filed Sept. 8, 1970, Ser. No. 69,640
Int. Cl. A47f 3/10
U.S. Cl. 312—135 12 Claims



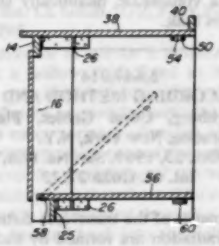

A tape cassette display fixture is disclosed wherein tape cassettes are displayed in a manner which minimizes the possibility of theft while exhibiting tape cassettes in an attractive manner, facilitating observation of both sides of the cassette by potential purchasers.

3,644,011

## COLLAPSIBLE CABINET

Kenneth A. MacDonald, 251 York St., Canton, Mass.

Filed July 20, 1970, Ser. No. 56,535
Int. Cl. A47b 43/00
U.S. Cl. 312—258 3 Claims




A cabinet is formed with hinged sidewalls, a removable top and a hinged inner shelf adapted to fold into a thin, compact

unit for shipping and storing. The cabinet is readily folded and erected without the use of tools, the top locking in and out of position by means of snap catches.

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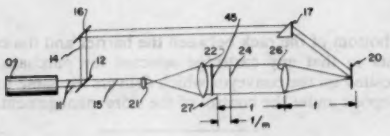
**3,644,012**
**RECORDING MICROHOLOGRAMS OF MAGNIFIED VIRTUAL IMAGES**
**Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.**
**Filed Oct. 16, 1970, Ser. No. 81,456**
**Int. Cl. G02b 27/00**
**U.S. Cl. 350—3.5** **4 Claims**




A microhologram of a magnified virtual image of the object is recorded. This is accomplished by a lens interposed between the object and the hologram. The object is positioned in a plane spaced from the front focal plane of the lens by a distance which determines the desired magnification. The hologram itself is disposed approximately in the rear focal plane of the lens. The hologram is reproduced by the conjugate reference beam of the one that was used for recording it. This will generate a magnified real image which may be projected on a screen. By means of a lens, the image may be directed in a desired direction. However, no lens is required for viewing the magnified reproduced object.

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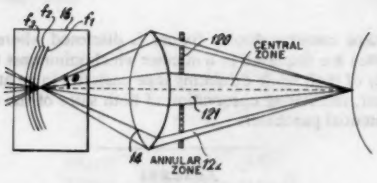
**3,644,013**
**THREE-DIMENSIONAL CAMERA**
**Gordon Gould, New York, N.Y., assignor to Holobeam, Inc., Paramus, N.J.**
**Filed Aug. 21, 1968, Ser. No. 754,335**
**Int. Cl. G02b 27/22**
**U.S. Cl. 350—3.5** **7 Claims**




A three-dimensional hologram producing camera utilizing a single lens system for providing a volumetric image on bulk sensitive film having a zone plate positioned in front of the lens to provide greater resolution to the recorded image point formed as a volumetric biconically shaped light distribution in the film bulk.

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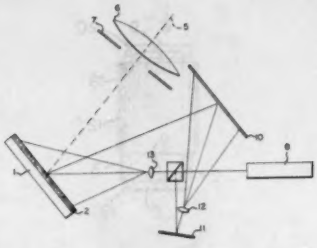
**3,644,014**
**IMAGE-RECORDING METHOD AND DEVICE**
**Joseph G. Hirschberg, Coral Gables, Fla., assignor to Research Corporation, New York, N.Y.**
**Filed Oct. 23, 1969, Ser. No. 868,787**
**Int. Cl. G02b 27/22**
**U.S. Cl. 350—3.5** **4 Claims**

Reproducible images of the transverse distribution of energy in a beam of radiation are formed by focusing the beam on a layer of an energy-absorbing substance of low heat conductivity which topically expands in proportion to the equivalent heat content of the radiant energy pattern in the beam to form a steric image thereof and recording the steric image thus formed by double-exposure holography. The




energy-absorbing reactive layer may be formed of natural substances, such as cork, or of artificial compositions, such as urethane or styrene foams. The reactive layer may be supported on a plate of metallic, plastic or vitreous material, and may be coated with an energy-absorbing coating.

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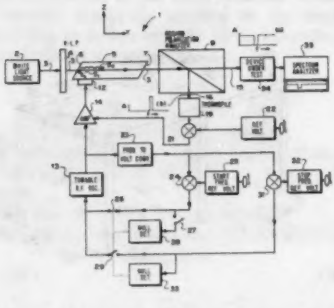
**3,644,015**
**ACOUSTO-OPTIC BAND REJECT LIGHT FILTER AND APPARATUS USING SAME**
**John R. Hearn, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed June 18, 1970, Ser. No. 47,267**
**Int. Cl. G02f 1/24**
**U.S. Cl. 350—149** **12 Claims**



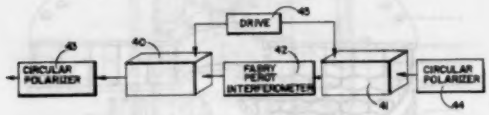
An acousto-optic band reject light filter is disclosed. The light filter includes an optically anisotropic medium, such as a birefringent crystal, in which an acoustic wave is excited at a certain selected radiofrequency corresponding to a selected optical frequency to be rejected. The crystal is disposed to receive an incident light beam containing the selected optical frequency to be rejected. The light beam is collinearly diffracted on the acoustic wave within the optically anisotropic medium to diffract light of a first polarization and of the selected optical frequency related to the acoustic frequency into light of a second polarization. The diffracted light beam is then passed through a polarization analyzer to reject from the diffracted light beam light of the second polarization while retaining in the diffracted light beam light of the first polarization. The selectable frequency in the light beam which is to be rejected can be tuned over a wide band by tuning the frequency of the acoustic wave within the crystal.

3,644,016

## OPTICAL ISOLATOR

John A. Macken, Orange, Calif., assignor to North American Rockwell Corporation

Filed Mar. 19, 1968, Ser. No. 714,307
Int. Cl. G02f 1/26
U.S. Cl. 350—150 1 Claim



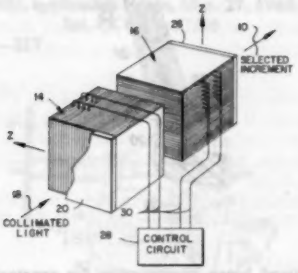

An optical isolator is constructed using a pair of rotating half-wave plates as the active elements. In a first embodiment, the rotating half-wave plates are arranged in series between a pair of linear polarizers, the spacing between the plates being adjusted to pass light travelling in one direction but not in the opposite direction. In a second embodiment, a Fabry-Perot interferometer is positioned between two rotating half-wave plates so as to pass circularly polarized light travelling in one direction but not in the opposite direction.

3,644,017

## ELECTRO-OPTIC LIGHT MODULATOR WITH AREA SELECTION

Richard S. Ploss, Danvers, Mass., assignor to Baird-Atomic, Inc., Cambridge, Mass.

Filed Dec. 2, 1968, Ser. No. 780,345
Int. Cl. G02f 1/26
U.S. Cl. 350—150 6 Claims




An electro-optic valve construction is capable of transmission throughout the entire field or at selected incremental regions. The construction is characterized by at least one stack of thin electro-optic plates, the opposite faces of which are in contiguity with interposed conducting strata. These plates are disposed in planes that are parallel to an axis of incident-collimated light in order to provide selected incremental windows under the control of selected pairs of conducting strata.

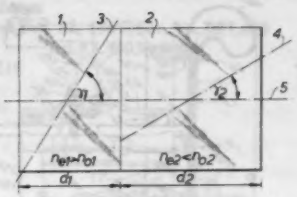
3,644,018

## DOUBLY REFRACTING CRYSTAL ARRANGEMENT FOR REDUCING APERTURAL DEFECTS

Guster Pasold, Dresden, Germany, assignor to Veb Kombinat Robotron, Radeberg, Germany

Filed Mar. 24, 1970, Ser. No. 22,202
Int. Cl. G02b 5/30
U.S. Cl. 350—157 5 Claims

Arrangement of doubly refracting crystals for reducing apertural defects characterized in that there is added to a double refracting crystal a second double refracting crystal having the same geometrical form but having an opposite sign of double refraction, the optical axis of the second crystal being located in the plane defined by the system axis and the optical axis of the first crystal.

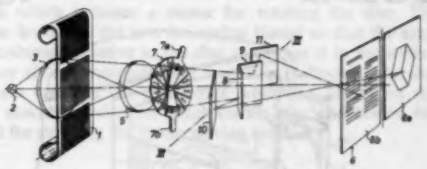



3,644,019

## OPTICAL APPARATUS FOR THE REPRODUCTION OF SUPERIMPOSED PICTURES

Friedrich Bestenreiner, Grunwald near Munich; Reinhold Deml, Munich; Ulrich Greis, Miesbach, and Josef Pfeifer, Unterbaching, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1969, Ser. No. 863,775
Claims priority, application Germany, Oct. 5, 1968, P 18 01 540.2
Int. Cl. G02b 27/18, 27/38
U.S. Cl. 350—162 SF 13 Claims



Images of two or more groups of pictures exposed onto a photosensitive record carrier in the presence of gratings are projected onto a screen by focusing all of the pictures into a focal plane which accommodates several adjustable diaphragms or analogous image selecting devices each blocking all but one image of the corresponding group. Mirrors or analogous optical deflecting components are used to project the unblocked images from the focal plane onto separate sections of a screen so that two or more images can be viewed simultaneously.

3,644,020

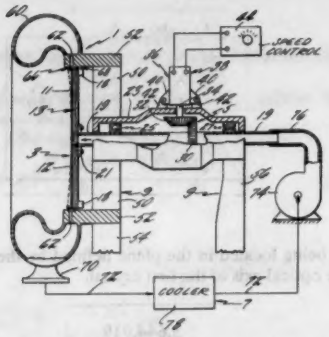
## VARIABLE CONTOUR REFLECTOR WITH COOLING SYSTEM

Thomas E. Shannon, Knoxville, Tenn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 6, 1970, Ser. No. 17,103
Int. Cl. G02b 5/10; F21v 29/00
U.S. Cl. 350—295 11 Claims

A circular reflector or mirror is mounted in a housing for rotation about a hollow shaft fixed to its center. A drive mechanism is provided to drive the reflector at various speeds. The reflector is provided with channels therein from its center to its outer periphery through which a coolant can flow from said hollow shaft to cool the reflector. A manifold is located around the periphery of the reflector to receive any coolant which passes therefrom. The coolant passes from the manifold and is recirculated through a cooler by a pumping means and directed back into the hollow shaft. Weights are located on the outer periphery of the reflector, offset

from the center plane of the reflector, to provide a force when the reflector is rotated to vary its contour. The outer periphery of the reflector is connected to the manifold by




sealing means to minimize loss of coolant at this point. The channels of the reflector can provide some pumping action if necessary.

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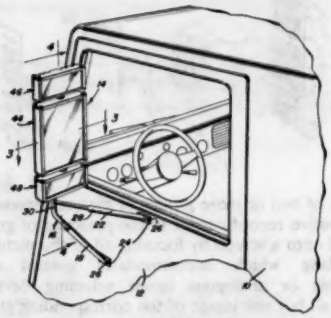
3,644,021

## ADJUSTABLE VEHICLE MIRROR

Robert L. Hamby, Dodge City, Kans., assignor to Richard A. Wolfe, Dodge City, Kans., a part interest

Filed May 11, 1970, Ser. No. 36,011
Int. Cl. G02b 5/08
U.S. Cl. 350—304 4 Claims



A rear vision mirror assembly for support from one side portion of a vehicle. The assembly includes a main upstanding mirror section of greater height than width and supported from a suitable support at two vertically spaced points for oscillation about an upstanding axis. The assembly further includes at least one upstanding secondary mirror section supported in vertically spaced relation relative to the main section by a ball and socket structure disposed between the main section and the secondary section whereby the secondary section may be universally adjusted relative to the main section.

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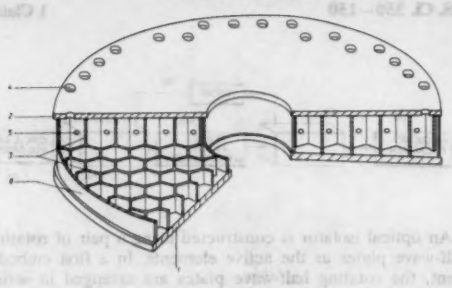
3,644,022

## OPTICAL MIRROR

Reinhard Jagdt, Mainz-Gonsenheim, and Ingo Kloss, Grossauheim, both of Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau am Main, Germany

Filed Sept. 14, 1970, Ser. No. 72,062
Claims priority, application Germany, Oct. 18, 1969, P 19 52 584.9
Int. Cl. G02b 5/08
U.S. Cl. 350—310 5 Claims

An optical mirror essentially consisting of a material containing silicon dioxide, for example, quartz glass, comprising a reflective plate, a carrier plate, and a supporting frame intermediate said plates and connecting them to each other and having a honeycomb structure consisting of a plurality of hexagonal cells, in which the supporting frame is composed



of a plurality of Y-shaped elements and the outer longitudinal edges of the three wings of each of these elements are welded together with the corresponding edges of the wings of the adjacent elements so that each hexagonal cell is formed by two wings of each of three adjacent elements.

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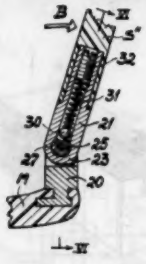
3,644,023

## SPRING-LOADED SPECTACLE HINGE

Luciano Villani, 2 Via Doria, 20026 Nova Milanese, Italy

Filed Jan. 21, 1970, Ser. No. 4,604
Claims priority, application Italy, Jan. 22, 1969, 11864-A/69
Int. Cl. G02c 5/16, 5/22
U.S. Cl. 351—113 4 Claims




An improved hinge construction for spectacles, wherein two components are secured to the frontpiece and respectively the side arms of the spectacles' frame, the said components comprising cam means and spring-biased cam follower means for providing an elastic resistance to widening apart of the side arms, outside of a given service position, and planar faces complementary arranged for abutting on each other when a given excess-wide position is attained, providing a positive stop to further widening apart.

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3,644,024

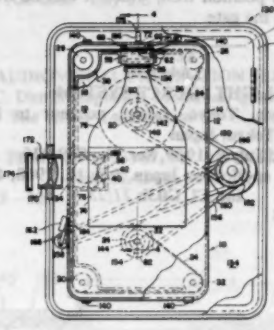
## APPARATUS FOR PROCESSING A STRIP OF PHOTOGRAPHIC MATERIAL

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1969, Ser. No. 788,897
Int. Cl. G03c 11/00
U.S. Cl. 352—130 24 Claims

A motion picture film-processing system employing an applicator having an orifice through which processing fluid may be expressed onto a strip of exposed film as the film is drawn across the face thereof. Processing fluid is initially stored in a collapsible container having a weakened portion adapted to rupture when a predetermined compressive force is applied to the container. An expandable chamber having a restricted

exit orifice communicating with the applicator also has an entrance port connected to the weakened portion of the collapsible container. Positioned in operable relationship to the expandable chamber is a force-applying member adapted to exert a pressure on the fluid after it has been received into



that chamber to cause the fluid to be fed from the expandable chamber to the applicator. This system can advantageously be employed in a compact multipurpose film-handling cassette adapted to be mounted in both a camera and a projector.

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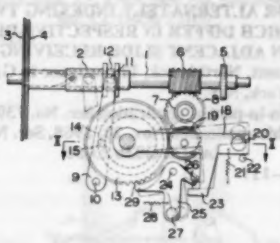
**3,644,025**

## DEVICE FOR CONTROLLING ANGLE OF OPENING OF SHUTTER FOR MOVIE CAMERA

**Yoshihisa Katsuyama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 2, 1970, Ser. No. 15,430**
**Claims priority, application Japan, Mar. 27, 1969, 44/26696**
**Int. Cl. G03b *21/36***
**U.S. Cl. 352—217** **4 Claims**



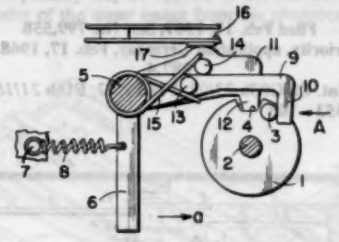
A device for controlling a variable shutter in a motor driven movie camera having a multibladed adjustable shutter in which relative movement between the shutter blades varies the opening angle of the shutter aperture. A driving train is provided for relatively moving the shutter blades which includes a cam connected to the shutter blades so that one revolution of the cam opens or closes the shutter aperture, a driven gear carried by the cam, clutch means, manually operable means for actuating the clutch means including a manually controlled lever movable between a first position in which a driven gear is disconnected from a driving gear and a second position in which the control lever actuates the clutch means to interconnect the driving gear with the driven gear. A detent pawl is engageable with the teeth of the driven gear for arresting variation of the shutter aperture, said detent pawl being movable in cooperation with the control lever to disengage it from the driven gear when the control lever is positioned in its second position.

**3,644,026**

## STOPPER DEVICE FOR ELECTRICALLY OPERATED SHUTTER OF A CAMERA

**Katuhiko Toda, Yokohama-shi, Japan, assignor to Canon Inc., Tokyo, Japan**

**Filed Dec. 22, 1969, Ser. No. 887,438**
**Int. Cl. G03b *9/10***
**U.S. Cl. 352—219** **7 Claims**



A stop device for holding an electrically operated camera shutter in a locked position is provided by a pair of arms pivotally mounted on a shaft with a release lever arranged to pivot the arms. In the locked position one of the arms engages a stop block on a rotatable disc while the other arm has a detent at its free end which engages within a notch in the circumferential periphery of the disc. The disc is associated with the shutter and is rotatable by the device which electrically operates the shutter. When the release lever pivots the arms to unlock the disc for rotation, one of the arms closes a switch which actuates a motor for rotating the disc. The release lever and the arm are spring biased so that the arms are positioned relative to the disc to engage it in the locked position after it completes one revolution. In locking the disc one arm contacts the stop block while the detent on the other arm drops into the notch on the disc and breaks the switch for stopping the motor driving the disc.

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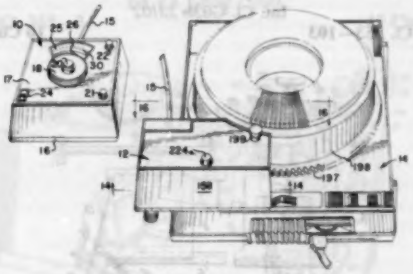
**3,644,027**

## RANDOM SELECTION SYSTEM FOR A SLIDE PROJECTOR

**Frank P. Bennett, Northbrook, Ill., assignor to GAF Corporation, New York, N.Y.**

**Filed June 24, 1968, Ser. No. 739,353**
**Int. Cl. G03b *23/06***
**U.S. Cl. 353—25** **13 Claims**



The random selection system consists of an attachment unit which is detachably mounted on the housing of the slide projector, a remote control unit which is separate and remote from the slide projector, and an extension cable connecting these units. The attachment unit contains a commutator. The remote control unit includes receiving means in the form of DC motor parts. The commutator acts as a transmitter and the motor parts as a receiver for stepping or rotating the

rotor in synchronization with rotation of the movable component of the commutator. The rotor drives a seeking contact for movement in an arcuate path.

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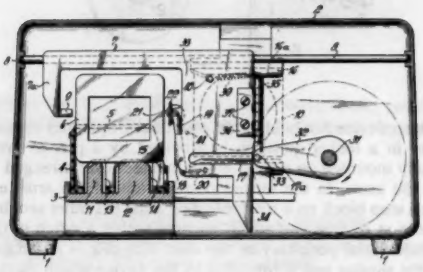
**3,644,028**
**SLIDE CHANGER MECHANISM FOR SLIDE PROJECTORS**

**Helmut Rube, Endersbach, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart-Unterturkheim, Germany**

**Filed Feb. 17, 1969, Ser. No. 799,558**
**Claims priority, application Germany, Feb. 17, 1968, P 16 22 087.4**
**Int. Cl. G03b *23/02*; F16d *7/02*; F16h *21/18***
**U.S. Cl. 353—103** **8 Claims**



Slides in a slide projector are movable from their tray to projection position and vice versa by a reciprocable carriage which is driven by an electric motor through the intermediary of a friction clutch when it transports slides back into the tray and through the intermediary of the friction clutch and a second clutch, which latter can transmit a weaker force than the friction clutch, when the slides are moved from the tray to projection position so that a slide which jams during movement toward projection position can be returned to the tray because the carriage is driven with a greater force when it moves slides back into the tray.

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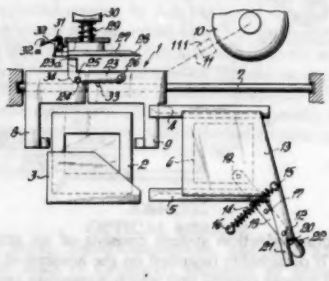
**3,644,029**
**SLIDE PROJECTOR**

**Albert Stieringer, Calmbach, Germany, assignor to Robert Bosch GmbH, Stuttgart-Unterturkheim, Germany**

**Filed Aug. 6, 1969, Ser. No. 848,010**
**Claims priority, application Germany, Aug. 14, 1968, P 17 97 084.1**
**Int. Cl. G03b *23/02***
**U.S. Cl. 353—103** **10 Claims**



A slide projector wherein the slide changer comprises two arms connected to each other by a coupling and wherein the gate is normally overlapped by a shutter. One of the arms serves to move the shutter away from closed position by way of a slide which is being transported from the magazine to projection position, and the other arm serves to return the slide from projection position back to the magazine. When the operator wishes to skip a slide and to retain the shutter in closed position, the coupling is disengaged to hold the one arm against movement with the other arm until a desired slide reaches the position from which it can be transported into registry with the gate.

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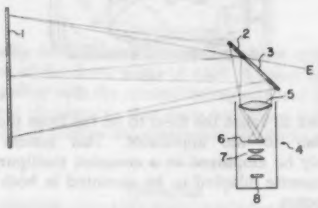
**3,644,030**
**LIGHT SOURCE SYSTEM**

**Yoshio Fukushima, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed July 8, 1969, Ser. No. 839,936**
**Claims priority, application Japan, July 12, 1968, 43/49223**
**Int. Cl. G03b *21/28***
**U.S. Cl. 353—98** **4 Claims**



A light source system for a projection system wherein a reflecting mirror having an observation window formed through a center portion thereof is inclined in front of a projector and an object illuminated by light beam from a ring-shaped light source or ring-shaped light source image is projected upon a reflex reflecting screen through said reflecting mirror so that the projected image may be viewed through the observation window.

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**3,644,031**
**MEANS FOR ALTERNATELY INDEXING TWO SLIDE TRAYS WHICH DIFFER IN RESPECTIVE DISTANCES BETWEEN ADJACENT SLIDE-RECEIVING SPACES**

**Frank P. Bennett, Northbrook, Ill., assignor to GAF Corporation, New York, N.Y.**

**Continuation-in-part of application Ser. No. 739,353, June 24, 1968. This application Nov. 20, 1968, Ser. No. 777,280**
**Int. Cl. G03b *23/06***
**U.S. Cl. 353—117** **1 Claim**

A slide projector is adapted for alternately receiving a "100-slide" tray and an "80-slide" tray. These trays have the same outside diameter. The "100-slide" tray is provided with 100 indexing teeth and the "80-slide" tray is provided with 80 indexing teeth, the teeth on the latter being shaped and spaced differently than the teeth on the former. The projector includes a single indexing gear having 12 teeth. During each slide-changing cycle, this indexing gear is rotated through 30°. Each tooth on the indexing gear engages the

teeth on the "80-slide" tray at the distal end of the former such that a 30° rotational movement of the indexing gear rotates the "80-slide" tray 4.5°. Each tooth on the indexing gear engages the teeth of the "100-slide" tray at a location inwardly of the distal end of the former so that 30° of rotational movement of the indexing gear serves to rotate or advance the "100-slide" tray 3.6°.

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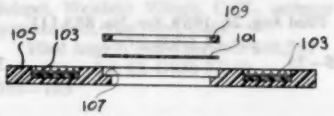
**3,644,032**

## AUDIOVISUAL PROJECTION SLIDES

**Panayotis C. Dimitracopoulos, Montreal, Quebec, Canada, assignor to The A. V. Corporation N. V., Curacao, Netherlands**

**Filed Feb. 10, 1967, Ser. No. 615,141**
**Int. Cl. G03b *21/00***
**U.S. Cl. 353—120** **8 Claims**




An audiovisual projection slide having a spiral sound track surrounding a projectable transparency, the sound track being formed on a magnetized film impressed with a spiral groove and the magnetized film having optionally beneath it a spongy, resilient, backing layer. The slide may constitute a data record card carrying on its surface the spiral sound track surrounding a window adapted to receive a projectable transparency, but in this case, the spiral sound track may also be of other desirable types, for example, phonographic.

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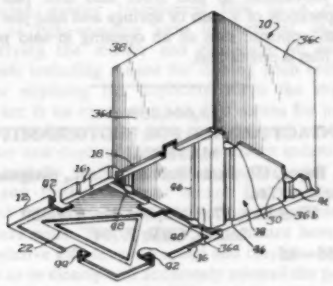
**3,644,033**

## SLIDE MAGAZINE

**Richard Frystak, Park Ridge, and Irwin M. Gould, Skokie, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.**

**Filed Sept. 23, 1969, Ser. No. 860,856**
**Int. Cl. G03b *21/00***
**U.S. Cl. 353—120** **8 Claims**



A novel slide magazine especially adapted to present slides accurately to a slide projector in a horizontal plane and to provide a convenient storage device for photographic slides.

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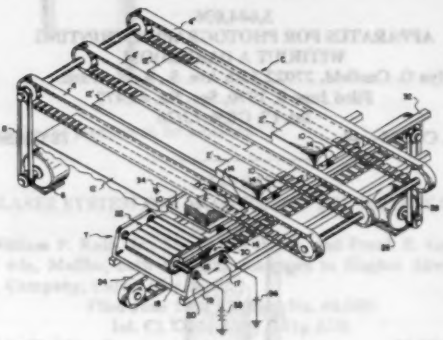
**3,644,034**

## BELT TRANSFER DEVICE

**Raymond L. Nelson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 16, 1970, Ser. No. 98,501**
**Int. Cl. G03g *15/16***
**U.S. Cl. 355—3** **7 Claims**

An electrostatic toner image transfer device is provided in which separate photoconductive elements are brought into registration at a transfer station against registration pins. Transfer of the toner image from the photoconductive element to a receiver sheet is accomplished by means of a transfer device comprising spaced rollers having an endless belt extending therearound which includes alternating conductor and insulative segments and has means for supporting the receiver thereon. A first potential can be applied to one roller to assure intimate contact between the receiver and the photoconductive element and a second and greater potential of the same polarity may be applied to the second roller to cause transfer of the toner image from the photoconductive



element to the receiver. As the transfer device is moved through the transfer station the receiver is brought into progressive line contact with the photoconductive element by the first roller followed by the second roller which causes image transfer from the photoconductive element to the receiver and separation of the receiver from the photoconductive element along a progressive line. The segmented belt supports the receiver stationarily against the photoconductive element and successively conducts the potential applied by the respective rollers to the receiver. A plurality of transfer stations can be provided so that a plurality of images can be transferred sequentially to a single receiver, if desired.

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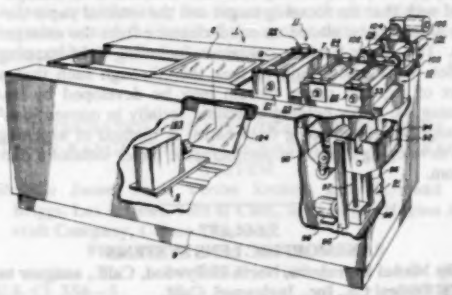
**3,644,035**

## FLAT PLATE TRAVELING ROLLER IMAGING SYSTEM

**Raymond K. Egnaczak, Williamson, and Gino F. Squassoni, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Nov. 14, 1969, Ser. No. 876,848**
**Int. Cl. G03g *15/00***
**U.S. Cl. 355—3** **19 Claims**



A photoelectrophoretic imaging machine employing a stationary electrode over which two imaging and one transfer roller electrode travels to form and transfer an image formed from photoelectrophoretic ink exposed to light and subjected

to electric field. The roller electrodes are journaled in two separate carriages with one drive mechanism employed to propel the carriages and a second drive mechanism employed to rotate the roller electrodes. The roller electrodes are lowered into contact with the stationary electrode by an elevator mechanism that enables the forces exerted on the roller to be varied from one end of a roller to the other. Means are provided for loading and ejecting a record sheet from the surface of the transfer roller. An auxiliary drive mechanism and cleaning station are positioned to engage the imaging roller electrodes after they pass over the stationary electrode.

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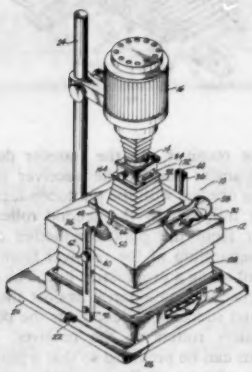
**3,644,036**
**APPARATUS FOR PHOTOGRAPHIC PRINTING WITHOUT A DARKROOM**

**Merlyn O. Canfield, 27022 12th Ave. S., Kent, Wash.**

**Filed June 8, 1970, Ser. No. 44,477**
**Int. Cl. G03b *13/26***
**U.S. Cl. 355—44** **18 Claims**



A lighttight casing adapted to be connected to the lens of a conventional photographic enlarger, and a lighttight photographic paper holding container movable in and out of the lighttight casing. The paper-holding container including a focusing target on one side, an opening having a slidable close on a second side opposite said focusing target and an internal paper display area aligned with the target and the opening. The paper-holding container adapted to be manipulated such that the focusing target and the internal paper display area may be placed an equal distance from the enlarger lens. The paper-holding container including light-trapping baffles which allow fluid to flow therethrough such that a sheet of exposed paper therein may be developed by immersing the paper-holding container serially in conventional photographic developing fluid baths. A method of exposing and developing a piece of photographic paper without a darkroom.

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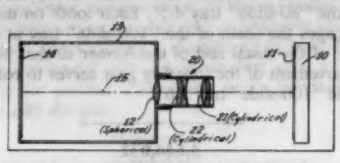
**3,644,037**
**ANAMORPHIC LENS SYSTEMS**

**Philip Michel Larraburu, North Hollywood, Calif., assignor to CK Optical Co., Inc., Inglewood, Calif.**

**Filed Apr. 28, 1969, Ser. No. 819,790**
**Int. Cl. G03b *27/68*; G02b *13/08***
**U.S. Cl. 355—52** **1 Claim**

An anamorphic lens system is provided which can be attached to a photographic camera. The anamorphic lens system takes width-compressed motion pictures and may be



used for cinema-to-graphic projection at correspondingly concurring width expansion.

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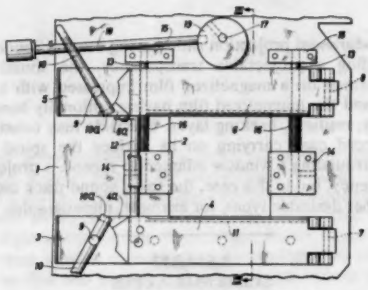
**3,644,038**
**FILM-HOLDING DEVICE**

**Gunnar Nils Uddgren, Vaxelmyntscatan, 41 D Goteborg, Sweden**

**Filed Aug. 26, 1969, Ser. No. 853,111**
**Int. Cl. G03b *27/62***
**U.S. Cl. 355—75** **3 Claims**



A film-holding device having two pairs of pivotally connected jaws for gripping and stretching film held therebetween, has one pair of said jaws fixedly mounted on a plate while the other pair of jaws is slideably mounted on said plate for movement to and from said first pair of jaws through operation of a cam or springs and said jaw pairs are each on an opposite side of an opening in said plate over which the film is positioned.

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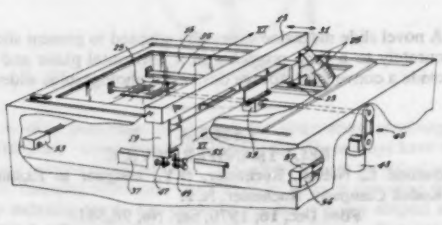
**3,644,039**
**CONTACT PRINTER FOR PHOTOSENSITIVE MATERIAL**

**Barton H. Boyer, III, Santa Barbara, Calif., assignor to Varo Inc., Garland, Tex.**

**Filed Nov. 17, 1969, Ser. No. 877,389**
**Int. Cl. G03b *27/04***
**U.S. Cl. 355—85** **1 Claim**



A cabinet for use with an optical system for exposure of either or both sides of a workpiece which is sensitive to light.

A transparent work holding frame, in which the workpiece is supported by a sheet of glass and covered by a sheet of plastic, is pivotally mounted on the cabinet. Air is withdrawn from between the glass and the plastic by a vacuum system acting through the pivot bearing structure and the vacuum created holds the workpiece firmly in place. A valve is mounted on the cabinet base for adjustment of the vacuum to preclude tearing or breaking the plastic when different sizes and shapes of workpieces are used. A sliding cam-latch is provided on the openable side of the frame to provide a positive closing between the members supporting the sheet of glass and the sheet of plastic. A safety interlock switch is provided to ensure that the lamp unit cannot be actuated when the work-holding frame is either open or pivoted from its normal position.

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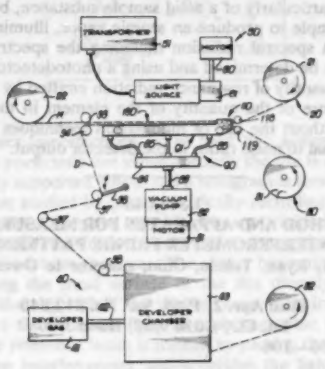
**3,644,040**

## APPARATUS FOR CONTINUOUS CONTACT PRINTING

**Robert Beispel, Westlake Village, Calif., assignor to Extek Microsystems, Inc., Van Nuys, Calif.**

**Filed Aug. 7, 1969, Ser. No. 848,201**
**Int. Cl. G03b *27/10***
**U.S. Cl. 355—103** **9 Claims**




An apparatus for continuous contact printing from an image-bearing master transparent film to a continuous duplicate or light-sensitive strip of material, including, a frame carrying the master and duplicate on supply and takeup reels including means for driving such reels, a light source for exposing the duplicate when the master and duplicate are in an exposure zone, and means for positioning the master and duplicate during continuous movement of such master and duplicate including vacuum means for guiding and initially compressing the master and duplicate together and further vacuum means for maintaining the master and duplicate in registry during movement through the exposure zone. The duplicate and master have substantially no relative difference in speed and may also be laterally aligned so as to closely and accurately control the positioning of the master and duplicate with respect to one another.

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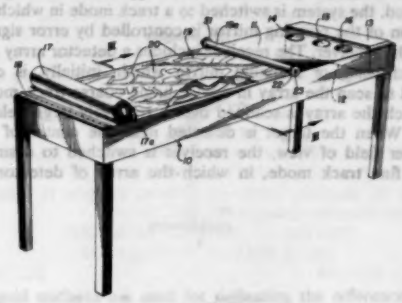
**3,644,041**

## COPIER FOR MAKING PRINTS OF PATTERN LAYOUTS ON LIGHT-SENSITIVE COPY PAPER

**Hans Haus, 6250 Limburg/Lahn, Germany**

**Filed Aug. 28, 1969, Ser. No. 853,824**
**Claims priority, application Germany, Sept. 28, 1968, P 17 85 486.3**
**Int. Cl. G03b *27/04***
**U.S. Cl. 355—122** **12 Claims**

This invention relates to a copier and, more particularly, to a copying machine for printing patterns and the like having means for holding the individual patterns in place while allowing the position to be adjusted.



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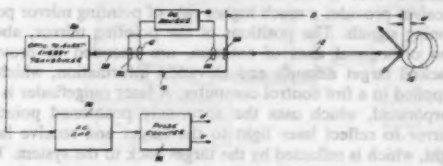
**3,644,042**

## LASER SYSTEM FOR MONITORING THE MOTION OF OBJECTS

**William P. Kolb, Jr., Manhattan Beach, and Frank E. Goodwin, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed June 15, 1970, Ser. No. 46,080**
**Int. Cl. G01c *3/08*; G01p *3/36***
**U.S. Cl. 356—5** **11 Claims**



The motion of an object may be monitored by directing a laser beam at both 3.39$\mu$ and 0.6328$\mu$ from a helium-neon laser oscillator toward the object to be monitored in such manner that a portion of the laser beam is reflected by the object back into the laser, causing the laser to produce output laser energy at 0.6328$\mu$ which varies significantly in intensity in accordance with the motion of the object. The number of intensity maxima and minima is indicative of the distance moved, while the number of maxima and minima per unit time is indicative of the velocity of movement. The 0.6328$\mu$ output laser energy may be detected and processed electrically to obtain distance- and velocity-indicating signals. A laser amplifier may be disposed in the path of the laser beam to extend the range of the system and/or enable monitoring of lower reflectivity objects.

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**3,644,043**

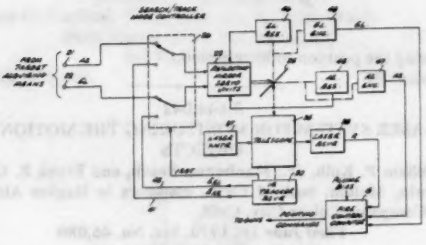
## INTEGRATED INFRARED-TRACKER-RECEIVER LASER-RANGEFINDER TARGET SEARCH AND TRACK SYSTEM

**Sheldon Jones, Palos Verdes Estates, and Raymond W. Briggs, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Aug. 11, 1969, Ser. No. 849,219**
**Int. Cl. G01c *3/08***
**U.S. Cl. 356—5** **7 Claims**

For use in a fire control system, a target search and track system to which approximate azimuth and elevation information of the position of a searched target is applied, when the system is in a search mode. The information is used to cause

a pointing mirror to point to the target, so that infrared energy is received therefrom, and is reflected to an infrared tracker receiver. Once infrared energy from tee target is received, the system is switched to a track mode in which the position of the pointing mirror is controlled by error signals from the receiver. The receiver includes a detector array and an oscillating, of scanning mirror which, initially, is controlled to scan the array in a wide-angle coarse track mode, in which the array is scanned over a relatively large field of view. When the target is detected near the center of the receiver field of view, the receiver is switched to a small-angle fine track mode, in which the array of detectors is



scanned over a much smaller field of view, so that the receiver provides a much higher rate of pointing mirror positioning signals. The positions of the pointing mirror, about two orthogonal axes of rotation, are encoded to provide tracked target azimuth and elevation information, which is supplied to a fire control computer. A laser rangefinder is incorporated, which uses the accurately positioned pointing mirror to reflect laser light to the target and receive laser light, which is reflected by the target back to the system. The laser rangefinder provides the tracked target range information.

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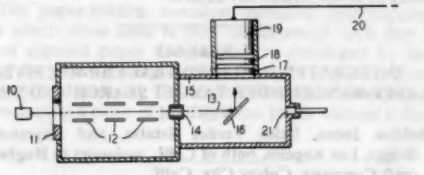
**3,644,044**

## METHOD OF ANALYZING A SOLID SURFACE FROM PHOTON EMISSIONS OF SPUTTERED PARTICLES

**Norman Henry Tolk, Westfield, and Clark Woody White, Dover, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.**

**Filed May 20, 1970, Ser. No. 38,961**
**Int. Cl. H01j** *37/26;* **G01j** *3/30*
**U.S. Cl. 356—85** **6 Claims**



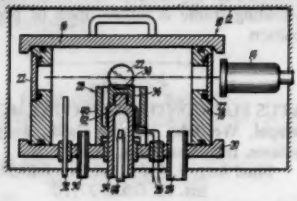
Identification of unknown constituents and their relative concentrations in a solid surface is made by bombarding the solid surface with an ion or molecule beam having low energy and low density, so as to achieve the sputtering of excited particles directly from the surface and resultant photon emissions characteristic of the sputtered particles.

**3,644,045**

## ATOMIC ABSORPTION SPECTROSCOPY

**Alan Walsh, Brighton, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Victoria, Australia**

**Filed May 1, 1969, Ser. No. 821,008**
**Claims priority, application Australia, May 1, 1968, 37184/68**
**Int. Cl. G01j** *3/42*
**U.S. Cl. 356—85** **20 Claims**



Method and apparatus for atomic absorption spectroscopic analysis, particularly of a solid sample substance, by sputtering the sample to produce an atomic vapor, illuminating the vapor with spectral radiation including the spectrum of an element to be determined and using a photodetector to measure the quantity of resonance radiation emitted by the vapor as a measure of the quantity of the element in the sample, with or without the use of modulation techniques to obtain usable signal to noise ratios in the detector output.

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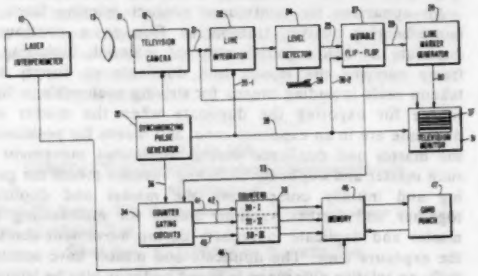
**3,644,046**

## METHOD AND APPARATUS FOR MEASURING INTERFEROMETER FRINGE PATTERNS

**William H. Ryan, Toledo, Ohio, assignor to Owens-Illinois, Inc.**

**Filed Apr. 2, 1969, Ser. No. 812,840**
**Int. Cl. ; G01b** *9/02;* **H04n** *3/00*
**U.S. Cl. 356—106** **15 Claims**



Method and apparatus for accurate automatic measurement of fringe pattern shift in an optical interferometer. Fringe patterns from an interferometer are imaged upon the photosensitive target of a television camera with fringe line patterns parallel to horizontal scanning lines or scanning raster of the TV camera. Scan line video signals from the camera are integrated and intensity detected to produce a corresponding binary fringe signal for controlling a bistable circuit which is caused to be in one or the other of its stable states according to whether the video signal from the TV camera is above or below, respectively, a selected threshold level, e.g. presence or absence of an interference fringe line during a line scan. Counters count the number of scanning lines occuring during the time the bistable circuit is in each of its states, respectively. Thus, the scanning lines between fringes as well as those covered by each fringe can be

counted for as many fringes as necessary to determine fringe positions. The center of a fringe may be located by dividing the number of scanning lines per fringe by two. Consult the specification for further features and details.

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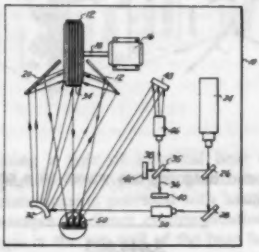
**3,644,047**

**APPARATUS AND METHOD OF SIMULTANEOUSLY INSPECTING A PLURALITY OF SURFACES OF A BODY BY HOLOGRAPHIC INTERFEROMETRY**

**Gordon M. Brown, Ann Arbor, and Kenneth R. Porter, Pinckney, both of Mich., assignors to GC Optronics Inc., Ann Arbor, Mich.**

**Filed May 8, 1956, Ser. No. 823,100**
**Int. Cl. G01b *9/02***
**U.S. Cl. 356—109** **12 Claims**



To detect imperfections on at least two nonparallel surfaces of a pneumatic tire simultaneously the tire is inflated on a rotatably supported wheel and a hologram is formed of surfaces to be studied by photographically recording the interference pattern between an object beam originating from a laser and reflected from the tire and a composite reference beam derived from the laser. The object beam is formed by illuminating the tread surface of the tire directly and illuminating the sidewalls if the tire by means of mirrors which also direct the reflected light to a photographic plate. The composite reference beam is formed by passing the laser light through an interferometer which divides the light into two components and recombines them after they have gone through different path lengths. Since the components have traveled through different distances to arrive at the plate different components of the beam will be coherent with the reflections from the various nonparallel surfaces of the tire thereby allowing the photographic plate to record interference patterns with reflections emanating from the surfaces. With the use of either the real time or double exposure technique any variations in the surface contour of the nonparallel surfaces of the tire will be revealed in the form of anomalies in fringe lines or shaded areas which appear on the hologram because of the interference of the two optical wave systems and may be viewed by appropriately illuminating the hologram with the reference beam.

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**3,644,048**

**BRIGHTNESS INDICATING COMPARISON DEVICE**

**Hans Gunther, Unterhaching; Georg Konigl, and Hans Kortner, both of Muenchen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed June 23, 1970, Ser. No. 49,038**
**Claims priority, application Germany, June 27, 1969, P 19 32 751.6**
**Int. Cl. G01j *1/10***
**U.S. Cl. 356—329** **10 Claims**

Reference light having a first color within a predetermined spectral range is combined with a colored part of the light to be measured which has passed through a filter having a second color within a spectral range complementary to the predetermined range. When the combined light assumes a third color, the brightness of the measured light is equal to the predetermined brightness of the reference light. Reflecting grid surfaces are used for deflecting the reference light into the path of the colored part of the measured light.

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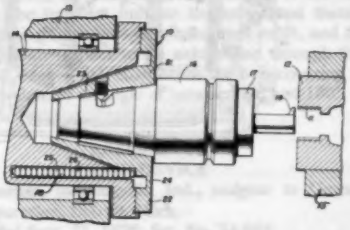
**3,644,049**

**MACHINE TOOL**

**Robert S. Hahn, Northboro; David H. Youden, and Arthur F. St. Andre, both of Worcester, all of Mass., assignors to The Heald Machine Company, Worcester, Mass.**

**Filed Nov. 26, 1969, Ser. No. 880,239**
**Int. Cl. B23b *49/00***
**U.S. Cl. 408—10** **4 Claims**



This invention relates to a machine tool and, more particularly, to apparatus for generating a surface of revolution with a single point tool where extreme accuracy is obtained by calculation of tool setting by means of electronic data processing.

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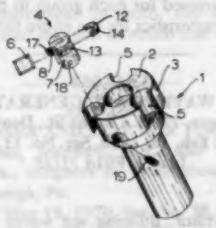
**3,644,050**

**CARTRIDGE-TYPE CUTTING TOOL WITH INSERT LOCK**

**Adam A. Schiller, Waukesha, Wis., assignor to Waukesha Cutting Tools, Inc., Waukesha, Wis.**

**Filed Apr. 2, 1970, Ser. No. 25,113**
**Int. Cl. B23b *29/03***
**U.S. Cl. 408—197** **9 Claims**



A rotary cutting tool having one or more cartridges for holding a cutting insert. Each cartridge is disposed in a lon-

gitudinal groove in the tool head, and a semicircular ringlike cam lock is disposed in a transverse slot in the cartridge body. Tightening of a setscrew in the cartridge body forces one cam lock end portion into engagement with the insert to lock it in place. The cam lock is also forced against the tool head groove wall to screw the assembly in place. An additional cartridge clamp is also provided for radial adjustment.

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**3,644,051**

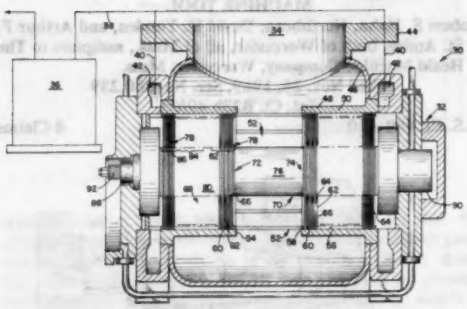
## TURBOMOLECULAR AND STATOR PUMP HAVING IMPROVED ROTOR CONSTRUCTION

**Ascher H. Shapiro, Cambridge, Mass., assignor to Sargent-Welch Scientific Company, Skokie, Ill.**

**Filed Oct. 27, 1969, Ser. No. 869,848**

**Int. Cl. F04b *19/16*; F04d *17/08***

**U.S. Cl. 415—90** **21 Claims**



An axial turbo-type vacuum pump operating in the free molecule flow pressure range and characterized by a number of multistage groups, each group being operable principally in a different pressure range, and each stage of each group comprising a rotor element and an associated stator element. Each rotor includes a hub portion and a row of blades extending radially outwardly therefrom, with the blades having leading and trailing edges, and front and rear blade face portions in respect to the direction of travel on the rotor element. Each stator is of approximately mirror-image configuration in relation to its associated rotor. The relation between blade thickness blade chord, interblade spacing, radial blade span and blade angle are different for the elements of each group, and these and other characteristics of the rotors and stators, including the presence of trailing edge-leading edge overlap, are determined for each group to provide optimum performance characteristics for the entire turbopump.

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**3,644,052**

## SEA WAVE POWER GENERATOR

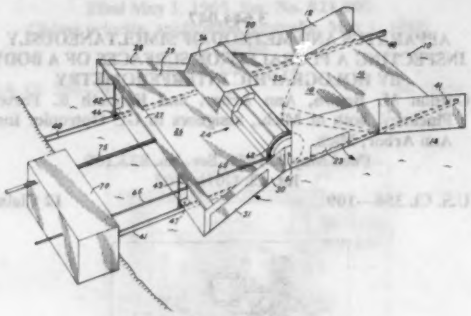
**William W. Lininger, 775 S. Corona St., Denver, Colo.**

**Filed Feb. 16, 1970, Ser. No. 11,481**

**Int. Cl. F01d *25/28***

**U.S. Cl. 415—7** **2 Claims**

A power generator, utilizing sea waves as a motivating mechanism, having a rotatable paddle wheel arranged to rotate a propeller shaft, includes a gathering platform to guide incoming wave propelled sea water in an overshot flow onto the paddle wheel and discharging the same into a catch basin which releases impounded sea water, on the wave recession, in an undershot paddle wheel flow to utilize both the incoming and outgoing sea waves as a source of power for the generator.



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**3,644,053**

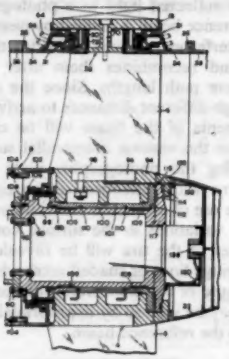
## WATER TURBINES

**Michael Braikevitch, and Emil Goldwag, both of Netherton, England, assignors to The English Electric Company, Limited, London, England**

**Continuation-in-part of application Ser. No. 804,446, Mar. 5, 1969, now abandoned. This application July 17, 1970, Ser. No. 55,641**

**Int. Cl. F01d *15/10*; F16c *7/04*; F01d *5/20***

**U.S. Cl. 415—173** **8 Claims**



An axial flow water turbine comprises a runner disposed for rotation in a water flow tube and carrying a peripheral drive member such as an electrical generator rotor. The runner is mounted on a stub shaft carried by an upstream supporting structure. The stub shaft is provided with discrete resiliently mounted bearing pads between which and the runner hydrostatic lubrication can be provided.

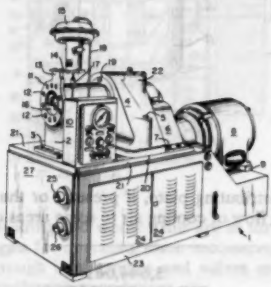
Preferably the stub shaft is hollow and each bearing pad is disposed in a recess formed in the stub shaft, the recess being provided with a detachable backing plate. Thus each pad can be withdrawn radially inwardly into the stub shaft and can be inspected or replaced without necessitating removal of the runner from the stub shaft.

3,644,054

## COMPRESSOR BASE AND INTERCOOLERS

Karol Pilarczyk, Loudonville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 8, 1970, Ser. No. 44,034
Int. Cl. F04c 29/58; F24h 9/08
U.S. Cl. 415—179 12 Claims



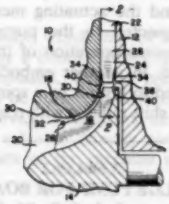
A base containing a pair of identical heat exchangers, demisters and separators has rigidly mounted thereon a cast multistage compressor casing provided with integral air inlet and discharge passages in direct communication with corresponding passages in the top wall of the base for providing the intercooling between stages. Fluid passes through the intercoolers by moving downwardly through the heat exchangers, downwardly through restricted nozzles and reversely upwardly for separating condensation, upwardly through the demisters and through central partition walls forming central manifold chambers. The liquid connections for the intercoolers may be uncoupled at one end for sliding the intercoolers off shelves from the opposite end. A telescopic resilient coupling between the casing inlet to the rotor and an inlet housing rigidly coupled to a fluid supply will prevent transmission of forces therebetween. The base further mounts the drive structure for the compressor and carries an oil sump below the drive structure.

3,644,055

## FLUID-MOTION APPARATUS

Raymond C. Davis, Phoenix, Ariz., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,205
Int. Cl. F04d 1/00, 17/08
U.S. Cl. 415—211 9 Claims



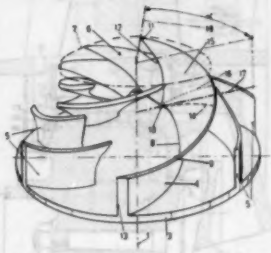
Fluid compressor, pump, or like fluid-motion apparatus having rotor with blades interposed in a housing chamber intermediate the fluid inlet and discharge ports. The blades have relieved areas formed in the lateral edges thereof which interface a wall of the chamber to communicate a high-fluid pressure zone on the one side of said blades with a low-fluid pressure zone at the other side of said blade, thereby to control the fluid boundary layer. Further included is a diffuser with similarly relieved areas in the vanes thereof to communicate the disparate pressure zones to either sides of the vanes.

3,644,056

## CENTRIFUGAL PUMP

Samuel I. Wiselius, Hengelo, Netherlands, assignor to Koninklijke Machinefabriek Stork N.V., Hengelo, Netherlands

Filed Mar. 6, 1970, Ser. No. 17,135
Int. Cl. F04d 7/00
U.S. Cl. 415—215 2 Claims



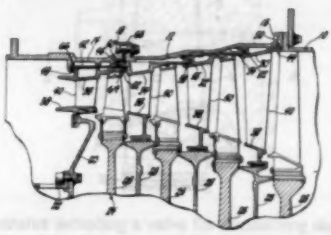
A centrifugal pump comprising a vaned impeller which has an axial inlet wherein the impeller vanes at the inlet end are extend in the normal direction of rotation of the impeller and in the axial direction, the extension from that end of the inlet edge adjacent the impeller hub, to the other end thereof gradually increasing from zero to a maximum value, and the total extension with respect to an axial plane through that end of the inlet edge which is adjacent the hub covering an arc length equivalent to an angle of between 30° and 180°.

3,644,057

## LOCKING DEVICE

Jay O. Steinbarger, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 21, 1970, Ser. No. 74,008
Int. Cl. F04d 29/40, 29/00; F01d 9/00
U.S. Cl. 415—218 8 Claims



A locking device utilizing a part-circular disc which, when rotated, serves to lock concentric cylindrical parts against axial or rotary movement or both, the disc then being retained in its rotated position to retain this locking arrangement.

3,644,058

## AXIAL POSITIONER AND SEAL FOR TURBINE BLADES

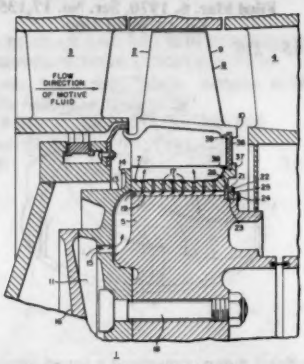
Philip S. Barnabei, Medford, N.J., and Norbert Vettel, Philadelphia, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 18, 1970, Ser. No. 38,197
Int. Cl. F01d 5/18
U.S. Cl. 416—95 9 Claims

The invention comprises novel structure for axial positioning of turbine rotor blades and for sealing the cooling air

passages under the blade root portions thereof.

The periphery of each rotor disc is provided with spaced, axially extending, side entry channels for receiving the root portions of the rotor blades. Cooling fluid is led into a passageway under the root portion of each blade and escapes through radial holes in the blade. An integral grooved extension is provided laterally of each root portion which supports thereon a downstream seal plate.




Sealing and locking segments are located downstream in a peripheral groove formed on the rotor disc, which segments effectively seal the root portions of the blades to the disc and prevent escape of cooling fluid. The sealing and locking segments cover a plurality of blades so as to reduce the number of leakage paths.

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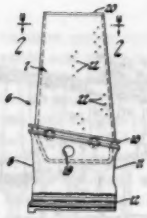
**3,644,059**
**COOLED AIRFOIL**
**John K. Bryan, 28 Harwood Drive E., Glen Cove, L. I., N.Y.**
**Filed June 5, 1970, Ser. No. 43,838**
**Int. Cl. F01d** *5/18*
**U.S. Cl. 416—97** **9 Claims**



A transpiration-cooled turbine blade has a porous wall and may have an internal strut extending spanwise of the blade and carrying cooling air into the blade. A honeycomb material with the cells extending generally from face-to-face of the blade is bonded to the interior of the blade wall and to the strut, if present. If there is no strut, the honeycomb extends from face-to-face, and has air supply passages cut through the honeycomb extending spanwise of the blade.

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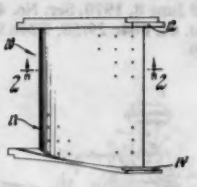
**3,644,060**
**COOLED AIRFOIL**
**John K. Bryan, 28 Harwood Drive E., Glen Cove, Long Island, N.Y.**
**Filed June 5, 1970, Ser. No. 43,837**
**Int. Cl. F01d** *5/08*
**U.S. Cl. 416—97** **8 Claims**

A transpiration-cooled turbine vane has a porous wall and an internal strut with a slidable dovetail connection to the wall to reinforce the wall. The dovetails may be directly on the wall or on a fluid distributing plate bonded to the wall.



This fluid distributing plate, if present, or the strut provides for metering flow of cooling air to some areas of the wall.

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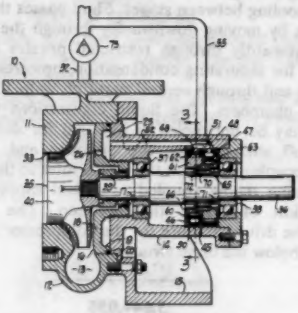
**3,644,061**
**PUMP APPARATUS**
**Stanley B. McFarlin, Jeromesville, Ohio, assignor to The Gorman-Rupp Company**
**Filed July 31, 1969, Ser. No. 846,477**
**Int. Cl. F04d** *9/00*; **F04c** *5/00*; **F04b** *17/00*
**U.S. Cl. 417—203** **21 Claims**



Pump apparatus embodying a flexible conduit which is collapsed to effect a pumping action. In one embodiment the flexible pumping conduit forms a priming mechanism for a centrifugal pump and the actuating member for collapsing the conduit is connected to the pump shaft by a drive coupling which prevents operation of the mechanism when the pump is primed. In another embodiment the actuating member is connected to a shaft by a spiral spring which permits the member to shift radially with respect to the shaft.

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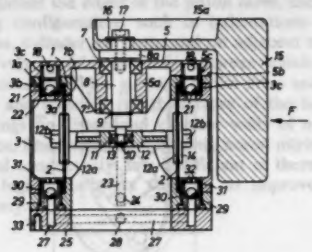
**3,644,062**
**BILGE PUMP FOR BOATS**
**Albert Cozic, 49, Avenue Isola-Bella-06, Cannes, France**
**Filed June 2, 1970, Ser. No. 42,717**
**Claims priority, application France, June 6, 1969, 6918853; Oct. 2, 1969, 6933728**
**Int. Cl. F04b** *19/00*
**U.S. Cl. 417—211** **11 Claims**

A bilge pump for a boat or vessel of any type is provided which is operative in response to any movement of the boat in which the pump is provided, such as pitching or rolling. The pump includes preferably two or three diaphragm-type pumps mounted in a housing. A vertical shaft is rotatably mounted in a housing, the shaft is secured to an unbalanced mass exterior responsive to the movements of the boat to ef-

fect the rotation of the shaft. The end of the shaft remote from the end at which the mass is secured comprises an eccentric journal which is connected to a two- or three-arm



member by a bearing and whose arms are in turn connected to the diaphragms for operating same successively to take in bilge water through intake pipes and valves and discharge same through outlet valves and pipes.

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**3,644,063**

**REGULATED HYDRAULIC APPARATUS**

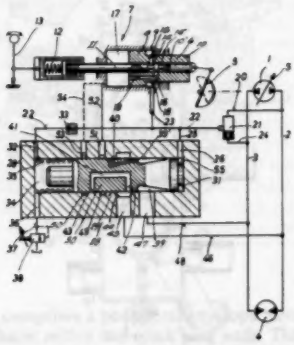
**Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany**

**Filed Apr. 6, 1970, Ser. No. 25,701**

**Claims priority, application Germany, Apr. 5, 1965, P 19 17 488.0**

**Int. Cl. F04b** *49/00*

**U.S. Cl. 417—213** **7 Claims**



A hydraulic machine, which may be a pump, or hydraulic motor is adjusted by a control device so that pressure fluctuations are compensated. When a pressure increase is so rapid that it cannot be corrected soon enough by the slowly operating control device, a regulating device is actuated by a pressure-reponsive valve to directly connect the high- and low-pressure conduits of the machine so that the pressure drops immediately.

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**3,644,064**

**FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES**

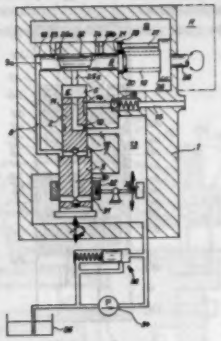
**Konrad Eckert, Stuttgart-Bad Cannstatt, and Gerald Hofer, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Apr. 16, 1970, Ser. No. 29,113**

**Int. Cl. F04b** *49/00*

**U.S. Cl. 417—293** **10 Claims**

In a fuel injection pump the quantities delivered during each pressure stroke thereof are varied by opening a bypass channel at a predetermined moment by means of a regulator shuttle driven from a constant abutment by hydraulic pressure generated by pump means operating synchronously with the main piston of the fuel injection pump. Said predeter-



mined moment is variable by turning said regulator shuttle. The moment fuel delivery starts during each pressure stroke may be changed without affecting the delivered fuel quantities by means delaying to a lesser or greater extent the buildup of said hydraulic pressure.

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**3,644,065**

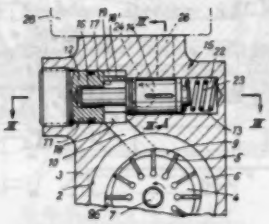
**APPARATUS FOR FILLING THE SUCTION CHAMBER OF A PUMP AT HIGH-PUMP SPEEDS**

**Rolf-Dieter Lettenmayer, Hirschlanden; Erich Schonherr, Ludwigsburg, and Egon Tittmann, Leonberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany**

**Filed Mar. 18, 1970, Ser. No. 20,555**

**Int. Cl. F04b** *49/00*

**U.S. Cl. 417—300** **12 Claims**



An apparatus including a valve for connecting the pressure discharge conduit of a pump with the suction conduit only at high-pump speeds so that the machine driven by the pump is partly bypassed. The pressure medium is accelerated in the suction conduit and applies suction to the outlet conduit of a container for the medium, which is connected by a filling conduit and by a single groove in the valve piston, with the suction conduit so that the suction chamber of the pump is completely filled.

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**3,644,066**

**FAN**

**Norvel J. Heob, Sturtevant, and Jon D. Stoor, Kansasville, both of Wis., assignors to MSL Industries, Inc.**

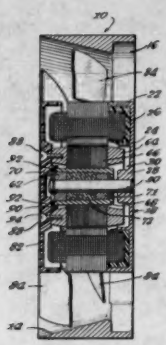
**Filed Oct. 13, 1969, Ser. No. 865,725**

**Int. Cl. F04b** *35/04;* **H02k** *5/16;* **B23p** *15/02, 15/04*

**U.S. Cl. 417—354** **12 Claims**

A ventilating fan in which a hub carrying a fan blade is affixed to a rotor which is rotatable about a fixed shaft. A sta-

tor assembly surrounding the rotor is fastened to a motor receiving member and has stator windings which are partially embedded in epoxy resin. The hub covers the rotor and stator assembly and serves as an oil seal for the rotor assembly.



A terminal block is provided having a pair of terminals which are twisted at one end with respect to their respective slots in an insulative member, to prevent longitudinal movement of the terminals in the direction of the other end.

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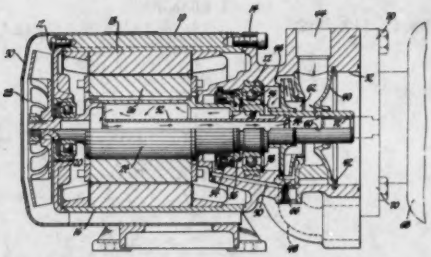
**3,644,067**
**POWER TRANSMISSION**
**Gordon H. Yowell, North Branch, Mich., assignor to Sperry Rand Corporation, Troy, Mich.**
**Filed May 25, 1970, Ser. No. 40,176**
**Int. Cl. F04b** *17/00, 35/00, 39/02, 39/06*
**U.S. Cl. 417—370** **2 Claims**



An electric motor-pump unit utilizes a hollow drive shaft supporting the motor rotor and the pump impeller. A sleeve within the hollow shaft forms a reentrant passage for conducting a portion of the pumped fluid into heat conducting relation with the motor rotor for cooling purposes. The unit is especially adapted for driving and supercharging high-pressure hydraulic pumps in aircraft.

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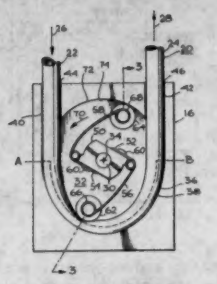
**3,644,068**
**PUMP ARRANGEMENT**
**Carley J. Lepak, Huntington Beach, Calif., assignor to Kenneth Leeds**
**Filed Mar. 12, 1970, Ser. No. 18,919**
**Int. Cl. F04b** *43/08*
**U.S. Cl. 417—477** **5 Claims**

There is described herein an improved pump arrangement for pumping materials contained entirely within a resilient tube. The material to be pumped is in a resilient tube which is positioned within a case means adjacent of bearing wall. A motor rotates a shaft upon which are a pair of spring-mounted spools. The springs urge the spools outwardly into contact with the resilient tube and the force exerted by the spring on the spool causes the spools to sequentially compress the resilient tube as the spools roll thereon. At least one



spool is in contact with and compressing the tube at all times. Rotation of the shaft pumps the material contained within the tube by the sequential compressing of the tube by the spool means.

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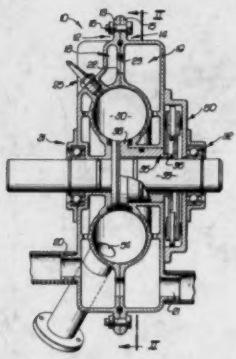
**3,644,069**
**ROTARY ENGINE CONSTRUCTION**
**George R. Stewart, 10049 Sideview Drive, Downey, Calif.**
**Filed Aug. 11, 1969, Ser. No. 848,989**
**Int. Cl. F01c** *19/00;* **F04c** *27/00;* **F02b** *53/00*
**U.S. Cl. 418—33** **5 Claims**



A rotary internal combustion engine including a toroidal housing having an annular cylinder formed therein, provided with spaced inlet and exhaust ports; a plurality of drive pistons equally angularly spaced in the cylinder and fixed through a drive disk to an output shaft; compression pistons in the cylinder between successive drive pistons, the compression pistons being fixed through a compression disk to a tubular countershaft coaxial with the output shaft; means for oscillatorily moving the countershaft and compression pistons during rotation of the output shaft and countershaft, including a raceway and rollers cammingly rollable in the raceway, the rollers being linkingly connected to the output shaft and to countershaft; sealing ring assemblies between the disks and between each disk and the housing, each ring assembly comprising two interengaged relatively rotatable rings, each ring having an outer side lying in a plane normal to the ring axis, an inner side describing a single turn helix about said axis, and a juncture portion having an axial length equal to the pitch of the helix, the rings being assembled with their inner helical sides in slidable juxtaposition, the ring assembly including resilient means for biasing apart the two

juncture portions whereby to tend to increase the effective overall width of a ring assembly; means to minimize leakage and blowby of compressed gases past the pistons during operation, including turbulence-inducing elements carried by the pistons adjacent the edges of the piston faces, and turbulence-inducing configurations such as indentations on the walls of pistons, cylinder, or both, and on adjacent surfaces of other relatively movable members between which sealing is necessary, including radial surfaces of the drive and compression disks and adjacent radial surfaces of the housing; liners or coatings on piston and cylinder walls of material such as asbestos, fused silica and pyrolitic boron nitride having low-thermal conductivity, low coefficient of thermal expansion, and high-temperature strength to improve combustion efficiency.

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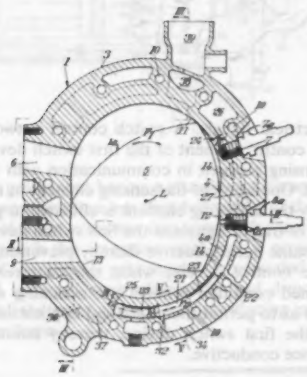
**3,644,070**

## COOLING CIRCUIT FOR ROTARY PISTON INTERNAL COMBUSTION ENGINES

**Lucien Lermusiaux, Saint-Etienne, France, assignor to Societe De Construction et D'Exploitation De Materiels et Moteurs S.C.E.M.M., Paris, France**

**Filed Sept. 30, 1969, Ser. No. 862,336**
**Claims priority, application France, Sept. 30, 1968, 168221**
**Int. Cl. F01c** *21/06, 1/02, 21/10*
**U.S. Cl. 418—61** **6 Claims**



The casing comprises a peripheral envelope having an inlet orifice, an exhaust orifice and spark plug wells. This envelope is cooled in its hot zone by a liquid circulating in a part of the cooling circuit. The successive cross sections of that part of the circuit are such that, at each cooled point of the envelope, the thermal exchanges take place in conditions of convection situated in the range 10° to 20° C. below the beginning of the nuclear ebullition conditions.

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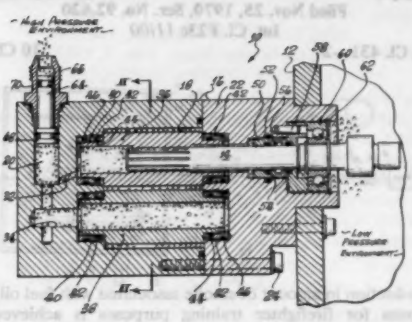
**3,644,071**

## PUMP FLUID MOTOR WITH PRESSURIZED BEARING LUBRICATION SYSTEM

**Stephen K. Schultheis, Tujunga, Calif., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Nov. 18, 1970, Ser. No. 90,559**
**Int. Cl. F01c** *21/04;* **F03c** *3/00;* **F04c** *29/02*
**U.S. Cl. 418—83** **7 Claims**

A pump fluid motor rotating impeller-type mechanism with pressurized bearing lubrication comprising: a body having an impeller cavity with an inlet and outlet, and an oil reservoir in communication with the cavity; a pair of hollow cylinder-type gear impellers mounted in the impeller cavity, the interior of each impeller being in communication with the oil reservoir; a pair of sleeve bearings rotatably mounting each impeller in the body for rotation in the cavity in an intermeshing relationship so as to be capable of transferring fluid between the inlet and the outlet; one end of each of the impeller sleeve bearings being in communication with the transferred fluid about the impellers and the other end of each of the impeller sleeve bearings being in communication with the oil reservoir; an O-ring sealing the rotary face of each sleeve



bearing, and another O-ring sealing the stationary face of each sleeve bearing; a shaft; means sealably mounting the shaft in the body with one end interconnected to one of the gear impellers and the other end extending from the body into a low pressure environment; and pressure reducing means communicating the oil reservoir with the exterior of the body for pressure application.

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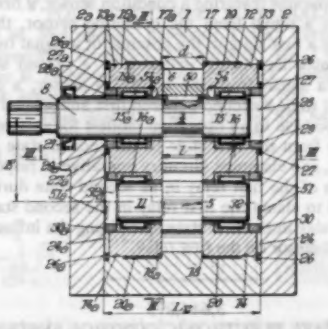
**3,644,072**

## HYDRAULIC GEAR PUMPS AND MOTORS

**Robert Gelin, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Appliquee S.I.G.M.A., Paris, France**

**Filed Sept. 8, 1969, Ser. No. 856,108**
**Claims priority, application France, Sept. 9, 1968, 165536**
**Int. Cl. F01c** *1/18;* **F03c** *3/00;* **F04c** *1/08*
**U.S. Cl. 418—206** **7 Claims**



Hydraulic gear pumps and motors having different displacements are provided by means of families of interchangeable parts. Leakage pathways from internal zones of high pressure are provided to a low-pressure zone in the vicinity of the intake.

**ERRATUM**

For Class 425—83 see:
Patent No. 3,644,078

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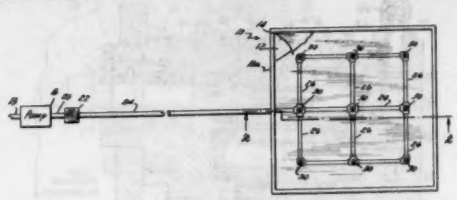
**3,644,073**

## METHOD OF SMOKE REDUCTION AND APPARATUS THEREFOR

**Alexander Goldsmith, Chicago, Ill., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Nov. 25, 1970, Ser. No. 92,620**
**Int. Cl. F23c *11/00***

**U.S. Cl. 431—2** **10 Claims**



Reduction in amount of smoke associated with fuel oil fires in pans for firefighter training purposes is achieved by providing atomized water sprays impinging on the fire just above the layer of burning oil which floats on a body of water in the pan. Water is pumped through spray heads at controlled rates via distribution system immersed in the water beneath the burning oil to prevent generation of steam.

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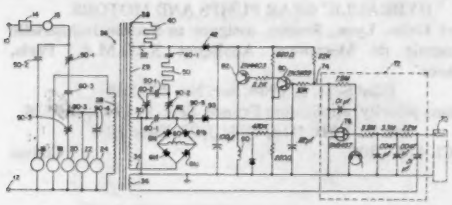
**3,644,074**

## CONTROL APPARATUS

**Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.**

**Filed Feb. 27, 1970, Ser. No. 15,014**
**Int. Cl. F23n**

**U.S. Cl. 431—26** **8 Claims**



Control apparatus featuring a condition sensor, a first relay responsive to a signal from the condition sensor, the first relay being in a first state in the absence of a signal from the condition sensor and being switched to a second state in response to a signal from the condition sensor, a control relay adapted to be switched between first and second states, circuitry responsive to an operation request for switching the control relay from the first state to the second state after a time interval, and clamping circuitry operative in response to the detection of the first relay in its second state during the time interval to clamp the first relay in the second state and the control relay in the first state, overriding the influence of the condition sensor on the first relay.

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**3,644,075**

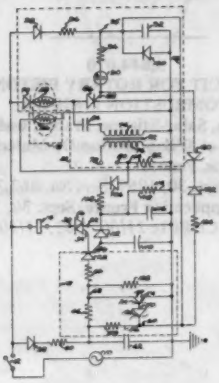
## FAIL SAFE ELECTRONIC-CONTROL SYSTEM

**David J. Squiers, Attleboro Falls, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sept. 24, 1970, Ser. No. 75,007**
**Int. Cl. F23n *5/00***

**U.S. Cl. 431—66** **19 Claims**

A system for maintaining a control device electrically energized only in response to the occurrence of a predetermined condition and for preventing energization of the control device in the absence of the condition. The system includes a first switch device, having a control element, the switch device being serially connected to the control device for controlling energization thereof. A system for producing high-voltage electrical signals for effecting the occurrence of the predetermined condition is provided, and is coupled to the first switch device for effecting energization thereof in response to the production of the high-voltage electrical signals. The system for producing the high-voltage electrical signals includes an actuating element which is rendered operable in response to continued production of the high-



voltage electrical signals. A switch control network is coupled to the control element of the first switch device and includes a sensing element in communication with the actuating element. Operation of the sensing element in response to actuation by the actuating element is effective to prevent the application of trigger signals to the first switch device so as to render the same nonconductive thereby preventing energization of the control device, while the occurrence of the predetermined condition renders the actuating element inoperable so as to permit the continued application of trigger signals to the first switch device, thereby maintaining the control device conductive.

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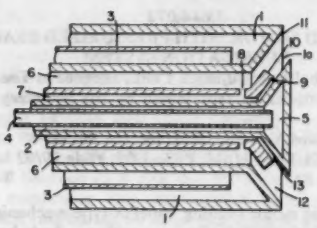
**3,644,076**

## LIQUID FUEL BURNER

**Leonard P. Bagge, Workingham, England, assignor to Shell Oil Company, New York, N.Y.**

**Filed May 1, 1970, Ser. No. 33,572**
**Claims priority, application Great Britain, May 8, 1969, 23,443/69**
**Int. Cl. F23q *9/00***

**U.S. Cl. 431—284** **10 Claims**




A liquid fuel furnace comprising a hollow coolant enclosure and at least a first annular oxidant channel therein adjacent to and concentric with a second annular liquid fuel channel inwardly of the first channel. A fuel supply opening

is in communication with both of the channels and a bluff body is disposed downstream of the opening and retracted with respect to the end face of the enclosure thereby forming, together with the opening, an annular fuel and oxidant discharge duct common to the first and second channels.

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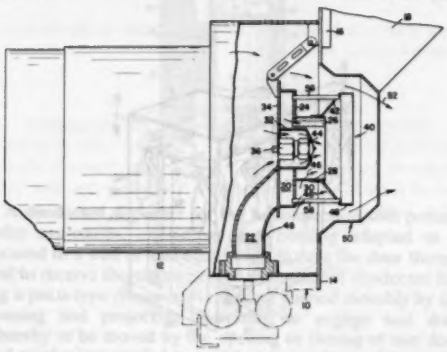
3,644,077

## FLAME STABILIZING SYSTEM FOR POWER GAS BURNERS

Enoch Alfred Dimick, Berkeley, Calif., assignor to S. I. Johnson Co., Oakland, Calif.

Filed Nov. 2, 1970, Ser. No. 85,866
Int. Cl. F23d *15/00*
U.S. Cl. 431—351 9 Claims



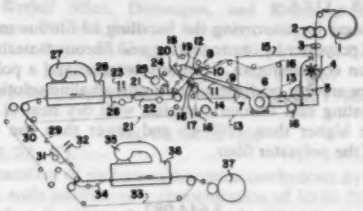
A power gas burner having a plurality of circumferentially spaced conventional gas jets directed axially of the burner. A conventional flame retention ring surrounds these gas jets. In accordance with this invention, said ring is provided with a plurality of secondary gas nozzles surrounded by an air supply and arranged circumferentially and disposed axially forwardly of the pure gas jets for introducing excess air to stabilize the flame.

3,644,078

## APPARATUS FOR PRODUCING NONWOVEN FABRICS

Sachihiko Tachibana; Susumu Nakai; Yoichi Makino; Hisashi Matsumura; Kimitaka Tabuchi; Michio Hiraoka; Shigeichi Akoh, and Hiroshi Orito, all of Tokyo, Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Original application Apr. 27, 1966, Ser. No. 545,678. Divided and this application Oct. 2, 1969, Ser. No. 871,044
Int. Cl. B29c *13/00*, *27/10*; D04h *1/64*
U.S. Cl. 425—83 6 Claims



An apparatus for producing nonwoven fabric comprising a duct for blowing fibers, a screen at the open end of said duct, a first endless wire-netting for receiving the fibers passed through said screen to form a band-shaped fiber mass on said first endless wire netting, a second endless wire-netting receiving said fiber mass from said first endless wire-netting, an adhesive sprayer provided at said second wire-netting, a suction section opposite to said sprayer, a dryer provided at said second wire-netting, a third endless wire-netting receiving said fiber mass from said second wire-netting, a second adhesive sprayer provided at said third wire-netting, a second suction section opposite to said second sprayer, a fourth endless wire-netting receiving said fiber mass from said third wire-netting, and a second dryer provided at said fourth wire-netting.

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# CHEMICAL

3,644,079

## METHOD FOR IMPROVING THE DYEABILITY AND FOR HEAT SETTING SYNTHETIC LINEAR POLYESTERS

Vernon C. Smith, Huntersville; James Barnette Hobgood, Roxboro, and Frederick E. Barwick, III, Charlotte, all of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed July 11, 1969, Ser. No. 840,936
Int. Cl. D06p *3/00*
U.S. Cl. 8—4 13 Claims

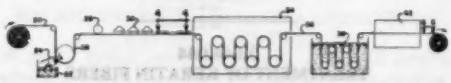
A method is provided for improving a dyeability and for heat setting synthetic linear polyesters, wherein the polyester in fibrous or film form is contacted at an elevated temperature, for example, 120° to 200° C. for about 1 to 20 seconds with a monocyclic or bicyclic halogenated aromatic hydrocarbon. The halogenated aromatic hydrocarbon is extracted from the polyester after treatment. The polyester fibers and films treated in accordance with the method of this invention exhibits superior dyeing properties being readily dyed to deep shades in the absence of a carrier. The polyester fibers and films treated in accordance with the present invention likewise exhibit improved dimensional stability.

3,644,080

## METHOD OF PRINTING SYNTHETIC LINEAR POLYESTER SHEET MATERIALS

Robert W. McCullough, Riverside, Conn.; Vernon C. Smith, Huntersville; Frederick E. Barwick, III, Charlotte, and James B. Hobgood, Roxboro, all of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 857,843
Int. Cl. D06p *3/00*
U.S. Cl. 8—4 10 Claims



A method is provided for printing synthetic linear polyester sheet materials such as films and fabrics, in which the area of material which is to be printed is initially treated with a halogenated aromatic hydrocarbon at an elevated temperature. The halogenated aromatic hydrocarbon is then removed and a composition containing a dyestuff is applied to the treated area to provided desired indicia on the polyester material. The method of this invention is particu-

larly useful in providing printed polyester films and printed heavy weight fabrics such as carpeting.

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3,644,081

## PROCESS FOR THE TREATMENT OF POLYESTER FIBEROUS MATERIALS

Shogo Matsuda, Toyonaka-shi; Yutaka Shimodoi, Suita-shi; Hiraku Yamada, and Kiyoshi Takao, both of Ibaraki-shi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1968, Ser. No. 708,506
Claims priority, application Japan, Mar. 7, 1967, 42/13892
Int. Cl. D06m *15/24*
U.S. Cl. 8—115.6 5 Claims

A process for improving the handling of fibrous materials made of polyester by impregnating said fibrous materials with a solution containing an alkaline substance and a polymeric substance soluble or dispersible in said alkaline solution, and then treating said fibrous materials with dry heat at a temperature higher than 120° C. and lower than the melting point of the polyester fiber.

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3,644,082

## PREPARATION OF DIETHYLAMINOETHYL COTTON USING NONAQUEOUS SOLVENTS

Ralph J. Berni, Metairie; Ruth R. Benerito; John B. McKelvey; Truman L. Ward, and Donald M. Soignet, all of New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture

Filed June 24, 1970, Ser. No. 49,412
Int. Cl. D06m *13/08, 13/38*
U.S. Cl. 8—116.2 7 Claims

Fibrous cellulosic material was impregnated with a swelling agent, solvent exchanged to remove any water present, and reacted with a solution containing sodium methoxide. This product was rinsed, then reacted with a solution containing 2-chloroethyldiethylamine and washed. The finished product was a partial cellulose ether having anion exchange properties with a wide range of ion exchange capacities. By converting the finished product to the acid salt form in situ catalytic sites for cross-linking reactions are provided. In addition, the diethylaminoethylated product may be converted to the quaternary form by refluxing with methyl iodide.

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3,644,083

## DURABLE FLAME RETARDANT FINISH FOR CELLULOSIC TEXTILE MATERIALS

Richard Frederick Stockel; William Frank Herbes, both of Bridgewater Township, Somerset, and Samuel James O'Brien, Dunellen, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 9, 1970, Ser. No. 27,167
Int. Cl. D06m *13/28, 13/44*; C09k *3/28*
U.S. Cl. 8—116.3 7 Claims

Flame retardant finishes for cellulosic textile materials containing tetrakis(hydroxymethyl)phosphonium phosphate, tris(hydroxymethyl)phosphine, and at least one organic nitrogenous compound.

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3,644,084

## TREATMENT OF KERATIN FIBERS

Du Yung Hsiung, Park Forest, Ill., and Leszek January Wolfram, Rockville, Md., assignors to The Gillette Company, Boston, Mass.

Filed Nov. 25, 1968, Ser. No. 778,797
Int. Cl. A61k *7/10*
U.S. Cl. 8—127.51 8 Claims

Keratin fibers are softened by sulfitolysis which forms S-sulfo groups or a mixture of S-sulfo groups with thiol groups in the fibers, then changed in configuration and maintained in the new configuration while restoring the fibers by treating with an aqueous solution containing at pH 5 to 11 from 0.02 to 0.3 mole per liter of an alkali metal, ammonium or lower alkanolamine sulfide or hydrosulfide, an aliphatic mercaptan, or mixtures thereof with each other or with an aliphatic disulfide. An aliphatic disulfide may be used alone when the ratio of S-sulfo groups to thiol groups in the sulfitolyzed keratin fibers is from 4:1 to 1:4.

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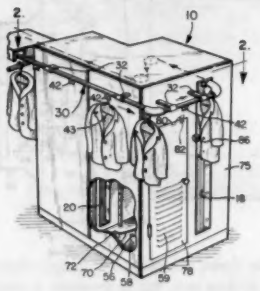
3,644,085

## GARMENT FINISHER AND METHOD OF FINISHING GARMENTS

Michael G. Beeley, North Salt Lake; Paul W. Frisby, and Richard D. Thompson, both of Salt Lake City, all of Utah, assignors to McGraw-Edison Company, Elgin, Ill.

Filed June 29, 1970, Ser. No. 50,578
Int. Cl. B08b *3/02*; D06c *1/06*
U.S. Cl. 8—150 17 Claims




A garment finisher with adjacent internally communicating conditioning and drying chambers, respectively each having horizontally narrow inlet and outlet openings, means discharging steam within the conditioning chamber and as converging inwardly directed jets from opposite sides of the inlet and outlet openings, and means directing heated air downwardly at high velocity within the drying chamber, a first conveyor for carrying successive garments suspended in adjacent generally edge-to-edge spaced orientation on approximately 20 to 30 inch centers to within the conditioning chamber and then through the drying chamber, a second conveyor for carrying the garments suspended within the conditioning chamber but in adjacent spaced generally front-to-rear orientation on approximately only 3 to 6 inch centers, means to transfer the garments from the first conveyor to the second conveyor and back again from the second conveyor to the first conveyor all in the conditioning chamber, means driving the conveyors in synchronization where the second conveyor feed is slower than the first conveyor feed by an approximate ratio of the garment center spacings of the respective conveyors, and the method of finishing garments including a dual-speed garment feed through adjacent conditioning and drying chambers where the garments are normally in general edge-to-edge orientation at liberal center spacings except in the conditioning chamber where they are in general front-to-rear orientation and at much reduced center spacings.

It is possible to finish garments, particularly those of a material having memory retaining characteristics, without actually pressing the garment between hot press faces. The garment is initially conditioned, by steam for example, and then is fluffed and dried typically with high-velocity heated air to remove the wrinkles. Equipment is available to finish the garments individually or in batches for each cycle of the finisher unit, or successively on a continuing progressive cycle basis where the garment moves relative to the finisher unit. Tunnel-type finishers, as they are called, operate according to the

last-mentioned basis and pass a series of garments successively and continuously, through adjacent internally communicating conditioning and drying chambers.

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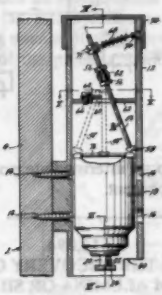
3,644,086

## DEODORANT DISPENSER

Jimmy R. O'Dell, 2240 West 72nd Street, Prairie Village, Kans.

Filed Apr. 27, 1970, Ser. No. 32,077
Int. Cl. A61l *9/00*
U.S. Cl. 21—77 5 Claims



A deodorant dispenser for use in connection with portable toilet enclosures, consisting of a housing adapted to be secured to a wall of said enclosure adjacent the door thereof, and to receive therein an aerosol container of deodorant having a press-type release valve, a lever carried movably by said housing and projecting therefrom to engage said door, whereby to be moved by the opening or closing of said door, and mechanism carried by said housing and operable to press said release valve each time said door is opened and closed.

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3,644,087

## PROCESS FOR SCRUBBING SULFUR DIOXIDE FROM A GAS STREAM

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 9, 1970, Ser. No. 9,968
Int. Cl. C01b *17/64*
U.S. Cl. 23—2 SQ 13 Claims

A process for the removal of $SO_2$ from a gas stream containing $SO_2$ and $O_2$ wherein the use of a conventional scrubbing solution containing an alkaline reagent results in the formation of undesired, intractable sulfate byproducts, is improved by adding to the scrubbing zone a reducing agent selected from the group consisting of finely divided sulfur, a polysulfide compound, a water-soluble sulfide compound and mixtures thereof, and by thereafter operating the scrubbing zone under thiosulfate-production conditions, thereby suppressing the production of undesired sulfate byproducts. Principal utility of this improved process is associated with a process for scrubbing $SO_2$ from a flue or stack gas stream. Key feature of this improved process involves the selective conversion of the absorbed $SO_2$ to the corresponding thiosulfate compound within the scrubbing zone, thereby minimizing the opportunity for the oxygen contained in the gas stream to oxidize the sulfite salt to the undesired sulfate byproducts.

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3,644,088

## PREPARATION OF TRANSITION METAL OXYHALIDES

Jay G. Bryson, Tallmadge; Henry R. Menapace, Stow, and Gereld S. Benner, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 14, 1970, Ser. No. 72,182
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 W 6 Claims

There is disclosed a method of preparing tungsten oxychloride, tungsten oxybromide, vanadium oxychloride and vanadium oxybromide which comprises passing at least one transition metal halide from the group of tungsten hexachloride, tungsten hexabromide, vanadium pentachloride and vanadium pentabromide, while in vapor form, over a catalyst comprising at least one oxide selected from the group of alumina, magnesia, silica, boria, calcium oxide, chromia, manganese dioxide, cobaltic oxide, nickel oxide, phosphorous pentaoxide, zinc oxide and mixtures thereof, at temperatures ranging from about 200° C. to about 300° C.

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3,644,089

## PREPARATION OF SODIUM CARBONATE

Franz-Rudolf Minz, Dormagen, and Eberhard Zirngiebl, Cologne-Flittard, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 25, 1969, Ser. No. 879,667
Claims priority, application Germany, Nov. 27, 1968, P 18 11 168.7
Int. Cl. C01d *7/00*
U.S. Cl. 23—63 6 Claims

Preparation of sodium carbonate monohydrate by reacting caustic soda solution of a concentration of 10 to 70 percent and carbon dioxide in the presence of solid sodium carbonate at temperatures of 80° to 115° C. the caustic soda solution and the carbon dioxide are continuously reacted in an aqueous sodium-carbonate-containing slurry at a pH-value of 11.3 to 11.5. By driving off the water fed in together with the caustic soda solution and by withdrawing a portion of the slurry, from which the sodium carbonate monohydrate formed in the reaction is recovered a sodium carbonate solid concentration of about 100 to 600 g./l. is maintained in the slurry.

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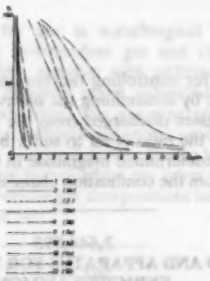
3,644,090

## PROCESS FOR THE PRODUCTION OF ACTIVE LEAD DIOXIDE

Hermann Beecken, Cologne-Stammheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 9, 1969, Ser. No. 856,354
Claims priority, application Germany, Oct. 2, 1968, P 18 00 489.2
Int. Cl. C01g *21/08*; B01j *1/00*
U.S. Cl. 23—146 9 Claims



Suspending lead sulphate, lead carbonate or mixtures thereof in water and adding to said suspension a halide and alkali in such quantitative proportions to obtain a higher basic lead halide or lead halide carbonate and thereafter oxidizing said compound with halogen or hypohalite under neutral or alkaline conditions thereby effecting precipitation of highly active lead dioxide.

## 3,644,091
## CLARIFICATION OF PHOSPHORIC ACID

John H. Naschke, and Robert L. Taylor, both of Houston, Tex., assignors to Esso Research and Engineering Company

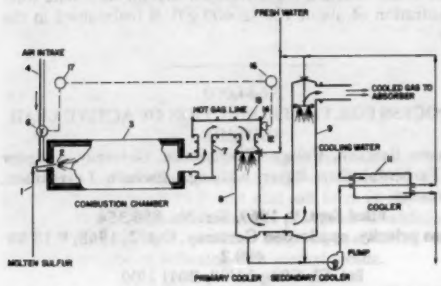
Filed Mar. 17, 1970, Ser. No. 20,181
Int. Cl. C01b *25/18, 25/22*
U.S. Cl. 23—165 13 Claims

Phosphoric acid in a wet phosphoric acid process is clarified by introducing into the acid a small but effective amount of a clarification additive which is a sulfonated polystyrene or a water soluble salt thereof having a molecular weight from about 1 to about 40 million and sulfonated in the para-position in the benzene ring in an amount of about 1 to 3 moles per mole of benzene ring, the clarification additive being added to the acid in one or more zones of the process.

## 3,644,092
## PROCESS FOR CONTROLLING THE BURNING OF SULFUR

Ivan D. Campbell, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Dec. 22, 1969, Ser. No. 887,292
Int. Cl. C01b *17/54;* F23n *5/00*
U.S. Cl. 23—179 8 Claims



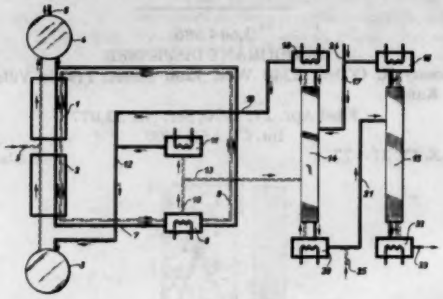

A method for controlling the burning of sulfur to obtain sulfur dioxide by determining the ultraviolet radiation of the combustion gases discharged from the combustion chamber and adjusting the ratio of air to sulfur being used to obtain a flame of a predetermined magnitude in the combustion gases discharged from the combustion chamber.

## 3,644,093
## METHOD AND APPARATUS FOR TREATING PRE-ENRICHED AMMONIA

Fortunat Hartmann, Zurich, and Hans Rudolf Gisler, Winterthur, both of Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed May 5, 1969, Ser. No. 821,862
Claims priority, application Switzerland, May 8, 1968, 6871/68
Int. Cl. C01b *5/02;* B01j *1/00;* F25j *3/00*
U.S. Cl. 23—204 C 12 Claims

The pre-enriched ammonia is delivered into the exchange column prior to the final enrichment stage and is placed into a material exchange with a portion of the deuterium-impoverished water from the rectifying column. The material exchange enriches the water with deuterium. The enriched



water is then fed into an intermediate point in the rectifying column for final enrichment.

## 3,644,094
## PROCESS FOR THE RECOVERY OF DIAMOND PARTICLES FROM ALUMINA OR SILICATE WASTES

Douglas N. Stevens; Ramond E. Bisque, and Duane N. Bloom, all of Golden, Colo., assignors to Earth Sciences, Inc., Golden, Colo.

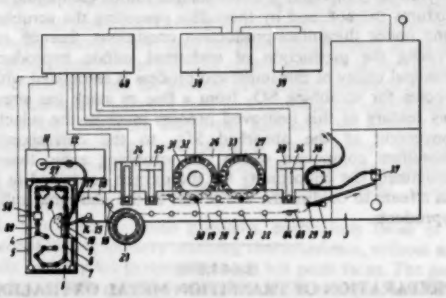
Filed Feb. 16, 1970, Ser. No. 11,922
Int. Cl. C01b *31/06;* C01f *7/34*
U.S. Cl. 23—209.9 8 Claims

Alumina wastes, and various silicate wastes, produced by grinding ceramic workpieces with diamond impregnated wheels are intermixed with a borax flux and heated in a nonoxidizing atmosphere to produce a fluid melt of the alumina and flux. The melt or resulting solid phase is then acid treated to dissolve and liquefy the alumina or silicate contents and the resulting liquor is drawn off leaving the particulate fraction which contains the desired diamond particles.

## 3,644,095
## APPARATUS FOR PERFORMING CHEMICAL ANALYSES

Heinrich Netheler; Gunter Bechtler, and Wilhelm Bergmann, all of Hamburg, Germany, assignors to Eppendorf Geraetebau Netheler & Hinz GmbH, Hamburg, Germany

Filed June 18, 1968, Ser. No. 737,981
Claims priority, application Germany, Dec. 20, 1967, P 16 48 900.2
Int. Cl. G01n *1/10, 1/14*
U.S. Cl. 23—259 7 Claims



Apparatus for handling samples of material wherein a first transport system intermittently moves units of the material in small steps and a second transport system receives sample portions of said units and intermittently moves these portions in larger steps; both systems operating with the same cadence.

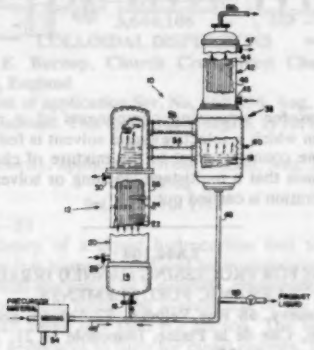
3,644,096

## APPARATUS FOR USE IN A CONTINUOUS FLOW REACTION FOR PRODUCING A MONOMER AND/OR A PROTOPOLYMER

Alan E. Lewis, and Frederick W. Voigt, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Original application Aug. 12, 1968, Ser. No. 752,058. Divided and this application Mar. 30, 1970, Ser. No. 29,318
Int. Cl. C07c 69/82; B01j 1/00
U.S. Cl. 23—263 3 Claims

Apparatus by which an esterification precursor is continuously converted to an esterification reaction product liquid by admixing a feed stream of the precursor into and with a circulating stream of the product liquid, heating the admixture to vaporize a low-boiling component, the heating being at a sufficient temperature and for a sufficient time to convert the precursor to the product liquid, and continuously withdrawing a stream of the product liquid from the circulating admixture.

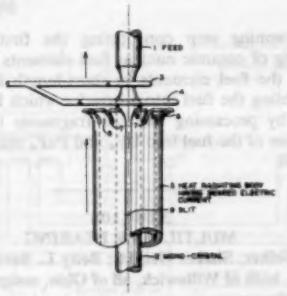


3,644,097

## APPARATUS FOR CONTROL OF HEAT RADIATION IN ZONE MELTING

Poul E. Knudsen, Skodsborg, Denmark, assignor to Haldor Frederik Axel Frydenlundsvej, Vedbaek, Denmark

Filed Nov. 13, 1968, Ser. No. 775,309
Claims priority, application Great Britain, Nov. 16, 1967, 52,181/67
Int. Cl. B01j 17/10
U.S. Cl. 23—273 SP 1 Claim



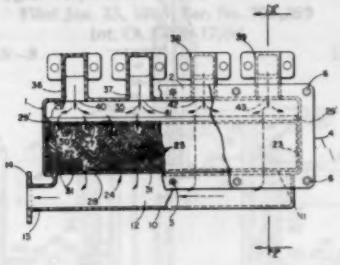
Control of heat radiation from the "critical zone" adjacent the molten material in a floating-zone purification of a semiconductor monocrystal to achieve a low level of dislocations.

3,644,098

## CATALYTIC CONVERTER FOR EXHAUST GASES

Ted V. De Palma, Roselle, and Robert S. Carleton, Libertyville, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 18, 1969, Ser. No. 858,918
Int. Cl. B01j 9/04; B01d 53/34; F01n 3/16
U.S. Cl. 23—288 F 8 Claims



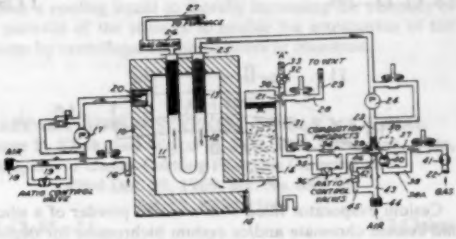
A catalytic converter for treating exhaust gas streams which has a removable catalyst cartridge embodied therein and which is designed to be connected directly to the exhaust ports of an internal combustion engine.

3,644,099

## GAS ATMOSPHERE GENERATING MEANS FOR HEAT-TREATING FURNACES

Roland C. Crans, Detroit, Mich., assignor to Holcroft & Company, Livonia, Mich.

Filed Sept. 15, 1969, Ser. No. 858,030
Int. Cl. B01j 7/00
U.S. Cl. 23—281 7 Claims



Gas atmospheres for use in metallurgical furnaces are prepared by burning hydrocarbon gas and circulating the products of combustion, together with additional hydrocarbon gas, through a catalytic retort subjected to the heat produced by the combustion. The gas-generating apparatus has a valved outlet for withdrawing excess products of combustion to be used for purging furnaces. It also has valve-controlled auxiliary air and hydrocarbon gas inlets which can be adjusted to produce various gas compositions including AGA gas-types 101, 302 and 501.

3,644,100

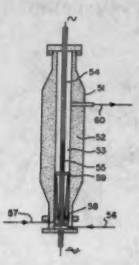
## APPARATUS FOR REFORMING HEAVY HYDROCARBONS

Pierre Lhonore, Douai; Jacques Quibel, Maisons Laffitte, and Michel Senes, Saint-Nazaire, all of France, assignors to La Societe dite Societ Chimique de la Grande, Paroisse, France

Filed Sept. 10, 1968, Ser. No. 758,768
Claims priority, application France, Sept. 12, 1967, 120743
Int. Cl. B01j 9/20; C01b 2/22
U.S. Cl. 23—288 S 2 Claims

A process for the catalytic reforming, with steam in a fluidized bed, of heavy hydrocarbons with a boiling point

higher than 220° C., carried out under an effective pressure of 2 to 150 bars, in which the reforming mixture is introduced to the catalyst in the form of catalytic particles of a solid solution of nickel oxide and refractory oxides, with a grain size which is between 1 mm. and 60 $\mu$, at a temperature



between 300° and 700° C., the volumetric speed on the fluidized bed is between 5 and 0.1 liter/hour per liter of catalyst, the ratio between steam and carbon in moles being between 0.75 and 3.0 and without regeneration or reoxidization of the catalyst.

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**3,644,101**

**CESIUM EVAPORATOR**

**Haruo Takashio, Tokyo, and Takayoshi Matsuzawa, Yokohama-shi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed June 6, 1968, Ser. No. 734,963**

**Claims priority, application Japan, June 10, 1967, 42/36770**

**Int. Cl. B44d *1/02*; C23d *1/02***

**U.S. Cl. 23—294** **1 Claim**

Cesium evaporator filled with a mixed powder of a silicon and cesium chromate and/or cesium bichromate for depositing cesium vapor on the face plate of a photoelectric tube, the silicon powder has such a particle size distribution that the average particle size is 30 to 80 microns, with particles larger than 100 microns or those smaller than one micron constituting not more than 30 weight percent, and the cesium chromate or cesium bichromate powder has such a particle size distribution that the average particle size is 3 to 10 microns with particles larger than 25 microns constituting not more than 30 weight percent and those smaller than 0.5 micron constituting not more than 40 weight percent.

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**3,644,102**

**CRYSTALLIZATION OF POTASSIUM CHLORIDE FROM CARNALLITE DECOMPOSITION**

**Hans Svanoe, Warren, Pa., assignor to Struthers Scientific and International Corporation**

**Filed Nov. 30, 1967, Ser. No. 686,826**

**Claims priority, application Great Britain, Dec. 1, 1966, 53,867/66**

**Int. Cl. B01d *9/02*; C01d *3/08***

**U.S. Cl. 23—298** **3 Claims**

Carnallite is decomposed by adding it to water under optimum conditions so that potassium chloride may be crystallized therefrom using potassium chloride seed crystals of over 60 mesh size.

**3,644,103**

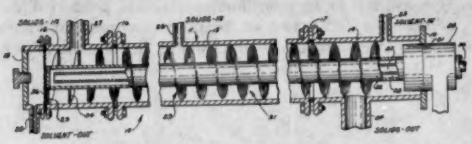
**COUNTERCURRENT SOLID-LIQUID CONTACTING USING FLEXIBLE BRISTLE SCREW FLIGHT MEANS**

**Chong Y. Yoon, Kalamazoo; Robert E. Melson, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Original application Oct. 6, 1967, Ser. No. 674,381, now Patent No. 3,529,938. Divided and this application Mar. 13, 1970, Ser. No. 24,409**

**Int. Cl. B01d *11/02, 9/00, 9/04***

**U.S. Cl. 23—310** **8 Claims**



A process for separating components of a mixture of chemicals in which a selective liquid solvent is fed through a treating zone countercurrent to the mixture of chemicals in such a fashion that a multistage leaching or solvent crystallization operation is carried out.

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**3,644,104**

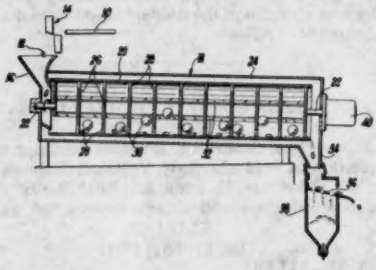
**PROCESS FOR PROCESSING CANNED IRRADIATED CERAMIC FUEL ELEMENTS**

**Georges Manevy, 68 Rue Velpeau, 92-Antony, and Georges Matcheret, Cite de la Plaine, Immeuble M 21, Apt 1599, 92-Clamart, both of France**

**Filed Oct. 23, 1968, Ser. No. 769,898**

**Int. Cl. C01g *56/00***

**U.S. Cl. 23—324** **6 Claims**



The decanning step constituting the first step in the reprocessing of ceramic nuclear fuel elements is carried out by cutting the fuel elements in short-length fragments and then crumbling the fuel into a powder which leaves the can fragments by processing the fuel fragments in a ball mill. Prefluoration of the fuel into $UF_4$ and $PuF_4$ may take place in the ball mill.

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**3,644,105**

**MULTILAYER BEARING**

**Milton L. Selker, Shaker Heights; Betty L. Berdan, and Betty M. Luce, both of Willowick, all of Ohio, assignors to Clevite Corporation**

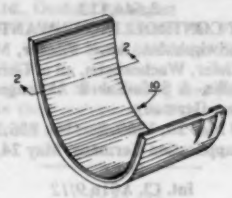
**Filed Mar. 3, 1970, Ser. No. 16,112**

**Int. Cl. B32b *15/00***

**U.S. Cl. 29—196.3** **4 Claims**

There is provided a multilayer bearing and method of forming same, said bearing characterized by its resistance to

seizure under high-load conditions, said bearing comprising a steel backing member, an electrodeposited intermediate



composite layer consisting of copper and molybdenum disulfide and an overlay of lead-tin alloy.

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**3,644,106**

## COLLOIDAL DISPERSIONS

**Victor C. E. Burnop, Church Croft, West Challow near Wantage, England**

**Continuation of application Ser. No. 660,896, Aug. 16, 1967, now abandoned. This application Aug. 3, 1970, Ser. No. 64,148**

Claims priority, application Great Britain, Aug. 24, 1966, 38,025/66

**Int. Cl. C10l** *1/32*

**U.S. Cl. 44—51** **7 Claims**

The tendency of a liquid hydrocarbon fuel to produce smoke when it is burned is reduced by incorporating into the fuel a colloidal dispersion of a sulphate, phosphate, or halide of an alkaline earth metal, the average size of the colloidally dispersed salt being less than 0.2 micron. The invention is particularly applicable to fuels for diesel engines. To prepare the dispersion, an alkaline earth metal oxide, hydroxide, carbonate, phenate, or salt of any weak acid is first dispersed in a lubricating oil or hydrocarbon fuel with the aid of a dispersing agent such as a phosphosulfurized hydrocarbon, an alkyl phenol or bisphenol, or a long-chain fatty acid amine. The dispersion is then treated with a hydrogen halide, or hydrochloric, sulphuric or phosphoric acid, or with an ammonium or volatile amine salt of one of those acids, thereby forming the desired dispersed salt in situ. The product is usually a concentrate which is then added to hydrocarbon fuel in the desired quantity.

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**3,644,107**

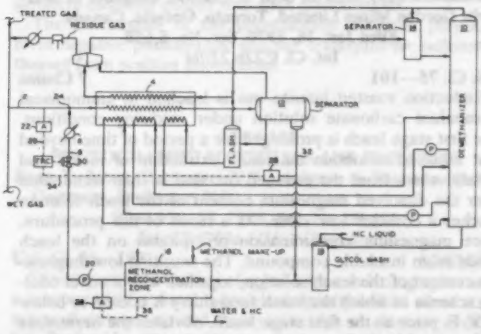
## METHOD FOR PREVENTING THE FORMATION OF HYDRATES AND ICE

**Merlin O. Clark, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed Mar. 9, 1970, Ser. No. 17,622**

**Int. Cl. F17d** *1/04, 1/05*

**U.S. Cl. 48—190** **4 Claims**




A method for preventing the formation of hydrates and ice in a gas by conditioning methanol and injecting said conditioned methanol into the gas conduit.

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**3,644,108**

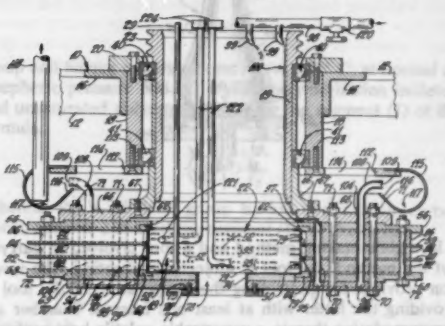
## METHOD AND APPARATUS FOR PRODUCING FILAMENTS BY CENTRIFUGAL FORCES

**Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation**

**Filed Jan. 23, 1969, Ser. No. 793,269**

**Int. Cl. C03b** *37/04*

**U.S. Cl. 65—8** **12 Claims**



The disclosure embraces a method of and apparatus for producing fine fibers or filaments of heat-softenable material such as glass and involves the formation of discrete streams of heat-softened glass of comparatively low viscosity by centrifugal forces, and dissipating or transferring heat from the streams to moving surfaces having passageway to accommodate a cooling liquid to thereby increasing the viscosity of the material of the streams to enable the attenuation of the streams by centrifugal action to fibers or filaments.

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**3,644,109**

## APPARATUS FOR SEVERING LINEAR MATERIAL

**Jerome P. Klink, and Walter F. Fulk, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation**

**Filed Dec. 29, 1969, Ser. No. 888,709**

**Int. Cl. B23d** *25/12*

**U.S. Cl. 65—11** **12 Claims**

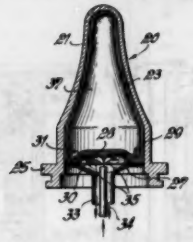
Apparatus for severing linear material including a cutter roll having blades thereon extending outwardly of the circumferential surface of the member and means communicating with the opposite sides of the blades in a region spaced from the circumferential surface to fix the cutting edge of the blades against movement circumferentially of the cylindrical member.

3,644,110

## GLASS-MAKING TOOL AND METHOD OF USE

Alfred Sendt, Guterslob, Germany, assignor to Firma Hermann Heye, Obernkirchen, Allee, Germany

Filed Mar. 5, 1970, Ser. No. 16,755
Claims priority, application Germany, Mar. 18, 1969, P 19 13 579.6
Int. Cl. C03b 11/12
U.S. Cl. 65—137 20 Claims



In a glass-making method and a tool involved in carrying out the method, the tool is subjected to heating. The invention provides for controlling the temperature of the tool by providing the latter with at least one internal chamber and accommodating therein a vaporizable volatile heat-exchange medium which is evaporable in the chamber in one region thereof as a result of the heating of the tool, moves to another cooler region where it becomes condensed, and is returned to the one region by capillary means accommodated in the chamber.

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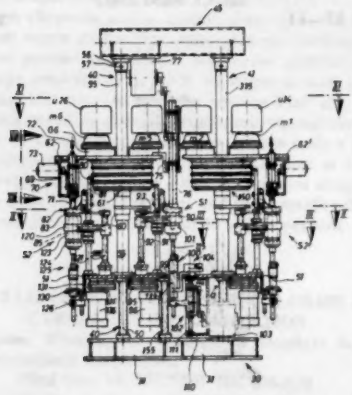
3,644,111

## MACHINE FOR THE PRODUCTION OF GLASS BOTTLES OR THE LIKE

Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Filed Dec. 26, 1968, Ser. No. 786,899
Claims priority, application Germany, Jan. 9, 1968, H 65000
Int. Cl. C03b 9/40
U.S. Cl. 65—158 48 Claims



A press-and-blow bottle-making machine wherein several neck rings orbit about a vertical axis and wherein each neck ring is moved by a separate motor so that the length of intervals during which the rings dwell at various treating stations and the speed of rings during travel between the stations can be selected as a function of the time required for treatment of workpieces carried by the neck rings at or between the stations.

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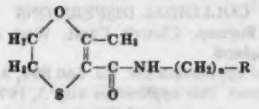
3,644,112

## METHOD OF CONTROLLING UNWANTED PLANTS

Hans Osieka, Ludwigshafen; Adolf Fischer, Mutterstadt, and Hans Eugen Kiefer, Wachenheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen Rhine, Germany

Filed May 20, 1969, Ser. No. 826,266
Claims priority, application Germany, May 24, 1968, P 17 68 542.6
Int. Cl. A01n 9/12
U.S. Cl. 71—90 3 Claims

New and valuable substituted 1,4-oxathiins having the formula



wherein $n$ denotes one of the integers 0 and 1 and $R$ denotes a monocycloaliphatic, bicycloaliphatic, tricycloaliphatic or tetracycloaliphatic radical having in all five to 15 carbon atoms, but not a cyclohexyl radical if $n$ is 0, which have a good herbicidal action. The compounds are particularly suitable for controlling unwanted plants without damaging crop plants. The compounds are also suitable for destroying all plants on a certain area.

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3,644,113

## AGGLOMERATE INCLUDING GRAFT COPOLYMERS OF ACYLIC ACID AND METHYL CELLULOSE AND METHOD OF MAKING

William J. Lang, Libertyville, Ill., and Joseph M. Chelini, Denver, Colo., assignors to International Minerals & Chemical Corporation

Filed Sept. 4, 1968, Ser. No. 757,468
Int. Cl. C21b 1/26; C08f 25/00, 43/00
U.S. Cl. 75—3 21 Claims

Water-soluble graft copolymers of acrylic acid and methyl cellulose, including water-soluble salts thereof, are useful as binders in the agglomeration of finely divided materials. The graft copolymers are especially useful as binders in the pelletization of minerals and ores, such as taconite.

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3,644,114

## METHOD FOR LEACHING REDUCED LATERITE ORES

Eva A. Vosahlova, Edmonton, and Donald Robert Weir, Fort Saskatchewan, Alberta, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Jan. 26, 1970, Ser. No. 5,658
Int. Cl. C22b 23/04
U.S. Cl. 75—101 7 Claims

Reduction roasted laterite ore is leached in ammoniacal ammonium carbonate solution under oxidizing conditions. The first stage leach is prolonged for a period of time beyond that required to obtain maximum extraction of nickel and cobalt values from the reduced ore and is then terminated after the dissolved magnesium content of the leach solution reaches a constant low value. As a result of this procedure, more magnesium contamination precipitates on the leach solids as an insoluble compound. The resulting low-magnesium content of the leach solution, together with a novel cooling scheme in which the leach feed slurry is cooled to below 115° F. prior to the first stage leach, obviates the heretofore serious problem of magnesium scale development in leach solution recycle lines.

3,644,115

## SOLDERING FILLER METAL

Hachiro Hamaguchi; Misao Sakashita, and Mamoru Koyama, all of Osaka, Japan, assignors to Tatsuta Electric Wire & Cable Co., Ltd., Osaka City, Japan

Filed Mar. 23, 1970, Ser. No. 22,016
Int. Cl. C22c 11/00, 13/00
U.S. Cl. 75—134 B 2 Claims

Tin-lead alloys used for soldering and plating metal wires are improved in their resistance to oxidation when they contain a small amount of aluminum.

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3,644,116

## IDENTIFICATION CARDS HAVING DIFFUSION TRANSFER LAMINATIONS

Paul A. Andrews, Belmont, and Bernard T. Coyle, Jr., Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 27, 1967, Ser. No. 618,685
Int. Cl. G03c 5/54
U.S. Cl. 96—29 14 Claims

Laminar structures comprising a photographic image in silver laminated to a transparent layer through or via a layer comprising a water-activated plasticized vinyl acetate polymer.

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3,644,117

## IMAGE-FORMATION IN STABLE POLARIZING MEDIA

Bruce E. De Palma, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 19, 1967, Ser. No. 610,378
Int. Cl. G03c 5/00, 5/04
U.S. Cl. 96—35 8 Claims

This disclosure concerns image-formation methods for forming visible images in polarizing media which are not generally considered photosensitive. The disclosed subject matter includes information pertaining to instantaneous film recording from television-type scanning signals, and the production of stereoscopic vectographic images.

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3,644,118

## POLYDIACRYLYL PHOTOSENSITIVE COMPOSITIONS

Ram K. Agnihotri, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,567
Int. Cl. G03c 1/52, 1/68
U.S. Cl. 96—115 R 42 Claims

A photoresist composition for use in photolithographic and photomechanical processes comprised of either cinnamates or quinone diazide sulfonates of polymeric materials derived by the alkaline condensation of vinyl ketones and acrylates, also referred to as polydiacrylyl methane polymers, and light sensitive elements coated with such compositions.

The cinnamates of the polydiacrylyl methane polymers form negative photoresists, and the diazoquinone sulfonates thereof form positive photoresists.

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3,644,119

## PHOTOGRAPHIC MATERIALS AND ELEMENTS

Evan T. Jones, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1970, Ser. No. 38,495
Int. Cl. G03c 1/28, 1/36, 1/84
U.S. Cl. 96—108 12 Claims

Direct positive emulsions fogged with a reducing agent and a compound of a metal more electropositive than silver contain a dinitro-substituted thiacyanine dye as electron acceptor. Preferably, the emulsions contain a synthetic polymeric latex and the dye contains a sulfoalkyl substituent.

3,644,120

## PHOTOSENSITIVE COMPOSITIONS

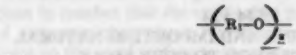
Tsunetoshi Kai, 328 Mizonuma, Asaka-cho, Kitaadachi-gun, Saitama-ken, and Mitsuhiro Inoue, 27-6, 3-chome, Nakadai, Itabashi-ku, Toyko, both of Japan

Filed Sept. 14, 1967, Ser. No. 667,656
Claims priority, application Japan, Sept. 27, 1966, 41/63381; Sept. 28, 1966, 41/63428
Int. Cl. G03c 1/68
U.S. Cl. 96—115 8 Claims

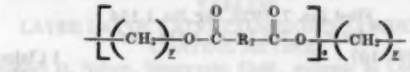
The photosensitive compositions comprising (a) an unsaturated polyester (b) at least one addition polymerizable ethylenically unsaturated monomer having at least one



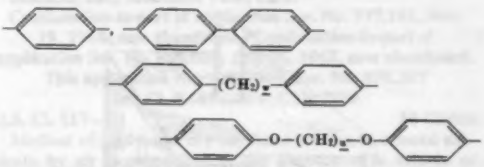
group and having a boiling point above 100° C. at normal atmospheric pressure and (c) a photopolymerization initiator, said unsaturated polyester comprising the segment (I) of the formula;



(wherein $R_1$ is alkylene group having two to four carbon atoms; and $x$ is 2 to 100) the segment (II) of the formula



(wherein $R_2$ is



or naphthylene; $y$ is 2 to 4; $z$ is 1 to 10; $w$ and $u$ are respectively 1 to 4) and the segment (III) corresponding to the residue of an unsaturated dicarboxylic acid. These photosensitive compositions are soluble in water or aqueous solvent such as an aqueous alkali solution and are nontacky solids at a temperature of 20° C.

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3,644,121

## METHOD OF PREPARING REHYDRATABLE DEHYDRATED PROTEIN PRODUCTS

Robert A. Boyer, Creve Coeur; Arthur A. Schulz, and Edmond A. Schatzman, both of St. Louis, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 210,843, July 18, 1962, now abandoned, Continuation-in-part of application Ser. No. 841,899, Aug. 23, 1965, now abandoned, Continuation of application Ser. No. 729,370, May 15, 1968, now abandoned. This application Jan. 5, 1970, Ser. No. 505
Int. Cl. A23l 1/20
U.S. Cl. 99—17 R 6 Claims

A rehydratable dehydrated protein product is made by mixing stretched, oriented precipitated isolated protein filament fibers with a food flavor and a heat-setting protein binder to form a moldable mixture, setting up the mixture and dehydrating it. The dehydrated product rapidly reconstitutes upon addition of water to form a product analogous to the mixture before dehydration.

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3,644,122

## ALKALINE TREATMENT OF COFFEE

James A. Yeransian, Pearl River, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 25, 1969, Ser. No. 861,140
Int. Cl. A23f 1/08
U.S. Cl. 99—71 8 Claims

Ground, roasted coffee or spent coffee grounds are treated

with an alkaline material to provide coffee extract in increased yield and with improved color.

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**3,644,123**

**PROCESS FOR REMOVING DELETERIOUS ACID COMPONENTS FROM STEAMED COFFEE**

**Esra Pitchon, Flushing, N.Y., assignor to General Foods Corporation, White Plains, N.Y.**

**Filed Nov. 19, 1969, Ser. No. 878,227**
**Int. Cl. A23f** *1/08*
**U.S. Cl. 99—71** **7 Claims**

Roasted and ground coffee is subjected to a dearomatization, steaming operation prior to percolation of the coffee. The flow of extract in the percolators is then controlled such that it passes through the steamed coffee and then through a bed of unsteamed coffee. The unsteamed coffee deacidifies the extract which contains acids picked up from the steamed coffee.

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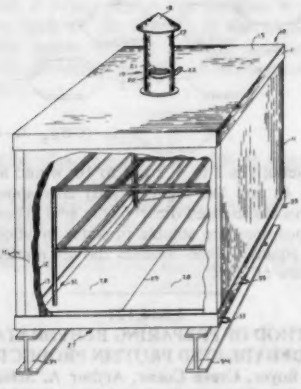
**3,644,124**

**METHOD OF COOKING AND IMPORTING NATURAL BARBECUE FLAVOR TO PORK MEAT**

**Raymond A. Bedsole, 202 West Hudson Street, Fayetteville, N.C.**

**Filed Jan. 7, 1970, Ser. No. 1,194**
**Int. Cl. A22c** *18/00*; **A23b** *1/04*
**U.S. Cl. 99—107** **1 Claim**



In abstract, a preferred embodiment of this invention is a barbecue type cooking process and device which uses an incline heat conductive drip plate having a controlled temperature to produce a pleasing barbecue flavor and aroma in cooked meats without necessitating the use of wood coals and other artificial flavoring means.

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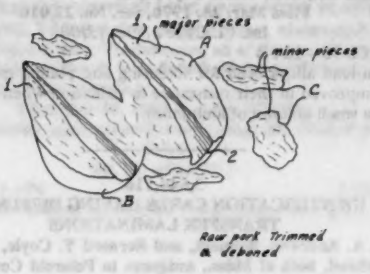
**3,644,125**

**PROCESS FOR PRODUCING COOKED HAMS**

**Salvatore J. Lobiondo, 12 Decamp Court, West Caldwell, N.J., and Joseph V. Lobiondo, 12 Winding Lane, Bloomfield, N.J.**

**Filed Jan. 29, 1970, Ser. No. 6,661**
**Int. Cl. A22c** *18/00*; **A23b** *1/00*
**U.S. Cl. 99—107** **2 Claims**

The bone is removed from a ham in known manner and the ham is cut in an axial plane of the hole that was formed when the bone was removed to provide two major integrally connected sections which re relatively moved to dispose their cut surfaces in approximately a common plane. Minor sections are severed from said major sections, after which said cut surfaces of the major sections and said minor sections are macerated. The minor sections are placed between the major sections which are moved into superposed relation to each other with the macerated surfaces of the pieces contacting each other, whereupon the assembly of major sections and




Raw pork Trimmed & deboned

minor sections is compressed in a mold and cooked so that the pieces are bonded together with bonds which are practically as strong as the tissue of any of the pieces.

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**ERRATUM**

For Class 99—135 see:
Patent No. 3,644,169

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**3,644,126**

**METHOD OF MAKING A STARCH CONVERSION SYRUP**

**Dean A. Bodnar; Charles W. Hinman, both of Clinton, and William J. Nelson, Camanche, all of Iowa, assignors to Standards Brands Incorporated, New York, N.Y.**

**Filed May 26, 1969, Ser. No. 827,982**
**Int. Cl. C12b** *1/00*
**U.S. Cl. 99—142** **10 Claims**

The disclosure is directed to a method of making a starch conversion syrup which includes treating an aqueous slurry of starch with a starch-liquefying enzyme under conditions to obtain therein a D.E. of less than about 35. This liquefied starch slurry is then digested with glucoamylase and malt enzymes to obtain a conversion syrup having less than 45 percent dextrose and sufficient maltose to provide at least 85 percent total fermentable sugars.

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**3,644,127**

**PRODUCTION OF SOLID FLAVORING COMPOSITIONS**

**Ralph G. Moores, Briarcliff Manor, and Charles L. Teitelbaum, New York, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Sept. 16, 1969, Ser. No. 858,506**
**Int. Cl. A23l** *1/26*
**U.S. Cl. 99—140 R** **9 Claims**

Solid flavoring compositions are produced by heating a sugar-water mixture to caramelization and then combining this mixture with a flavor oil such as a citrus fruit oil. The resultant liquid is then emulsified in a typical flavor fixative and spray dried to form a free flowing powder consisting of spherical particles having an outer surface flavor fixative literally encapsulating the flavor oil component.

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**3,644,128**

**METHOD OF PREPARING COMMINUTED MEAT PRODUCTS**

**Stuart Lipner, P.O. Box 2087, Newark, N.J.**

**Continuation-in-part of application Ser. No. 622,422, Mar. 13, 1967, now abandoned. This application Dec. 28, 1970, Ser. No. 102,135**
**Int. Cl. A22c** *11/00*, *18/00*
**U.S. Cl. 99—108** **3 Claims**

Protein enriched meat food products of improved texture, composition and nutritional value which comprises from

about 95.0 to 99.96 percent by weight of product of comminuted meat solids base and from 5.0 to 0.04 percent by weight of product of an edible nontoxic proteinaceous binder composition.

The protein binder of the meat product is water-soluble though it comprises principally spray-dried plasma from the blood of slaughtered livestock. However, this protein binder also includes less than 1 percent and preferably from 0.05 to about 0.01 percent by weight of a unique edible anticoagulant which remains in the plasma to complex the protein binder prior to use. This organic material is known popularly as carrageenan. The process for preparing meat products using the unique binder is also described and claimed.

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**3,644,129**

**METHOD OF PROCESSING POTATOES PRIOR TO COMBINED FREEZE DRYING AND AIR DRYING**

**Jerry L. Sloan, Portland, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.**

**Filed Oct. 15, 1969, Ser. No. 866,712**

**Int. Cl. A23b 7/03; A23l 1/12; A23b 7/04**

**U.S. Cl. 99—207** **3 Claims**

A process of treating potatoes prior to dehydration in which potatoes are cut into pieces of desired physical shape, blanched, cooled in either air or water, and then blanched again. The potato pieces are individually quick frozen and then dehydrated by combined freeze drying and air drying.

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**3,644,130**

**POWDERED WAX SUITABLE FOR EMULSIONS AND RUBBER BLENDING**

**Robert R. Evans, Fullerton, and Peter S. Backlund, Anaheim, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Filed Jan. 23, 1967, Ser. No. 610,821**

**Int. Cl. C08h 9/08**

**U.S. Cl. 106—270** **2 Claims**

Wax powder which is resistant to congealing is prepared by blending molten wax and an antiblocking agent, dispersing the blend, and then cooling the dispersed blend below its melting point to form the powder.

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**3,644,131**

**REINFORCING AGENT FROM SCRAP RUBBER CHAR**

**William W. Gotshall, 3081 Walma Drive, Orchard Lake, Mich.**

**Filed Mar. 25, 1970, Ser. No. 22,648**

**Int. Cl. C09c 1/44**

**U.S. Cl. 106—307** **10 Claims**

Scrap rubber, e.g., scrap tire stock, is destructively distilled to produce a carbonaceous char which is then ground to particles having an average particle size of less than about 2.5 microns with at least 99 percent by weight less than 5 microns. The grinding is accomplished under a nonoxidizing atmosphere and the particles are protected from oxygenation of their surfaces until they have been coated with an organic liquid. The resulting coated carbon particles are useful in the production of reinforced elastomeric compositions, e.g., SBR or EPDM or natural rubber, butyl or chlorobutyl tire components.

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**3,644,132**

**CONDUCTIVE MOLD COMPRISING A NONCONDUCTING SUPPORTING WALL AND A CONDUCTIVE GEL COAT APPLIED THERETO**

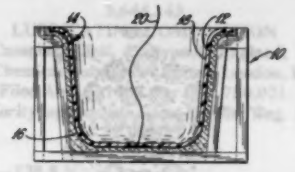
**Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation**

**Filed Oct. 21, 1968, Ser. No. 821,158**

**Int. Cl. B29c 1/04**

**U.S. Cl. 117—5.1** **2 Claims**

An inexpensive conductive mold designed primarily for low-production output is provided. The mold includes an insulating supporting wall having an exposed surface covered with a conductive gel coat comprising a tooling base resin and an electrically conductive filler of a carbonaceous material in particle form, particles being in contact to form a conductive network throughout the gel coat. Ground conductors are molded into the supporting wall and are in contact with the conductive gel coat, the conductors being sufficient in number that the conductive gel coat has a resistance of not more than about two thousand megohms from any point on the mold surface to the nearest conductor.

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**3,644,133**

**LAYER LATTICE STRUCTURED DRY LUBRICANT COATING METHOD**

**Robert D. Nelson, Sunnyvale, Calif., assignor to Lubrication Sciences, Inc., Mountain View, Calif.**

**Continuation-in-part of application Ser. No. 777,161, Nov. 19, 1968, now abandoned, Continuation-in-part of application Ser. No. 656,028, July 26, 1967, now abandoned. This application Nov. 19, 1969, Ser. No. 878,257**

**Int. Cl. B44d 1/094; C23c 7/00**

**U.S. Cl. 117—31** **10 Claims**

Method of applying a dry lubricant coating to a metal substrate by air impingement in the absence of a vehicle or binder including pretreating the particulate dry lubricant by heating at elevated temperature in a vacuum.

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**3,644,134**

**CONTACT EXPOSURE MASK FOR THE SELECTIVE EXPOSURE OF PHOTOVARNISH COATINGS FOR SEMICONDUCTOR PURPOSES**

**Dietrich Widmann, Munich; Rudolf Kappelmeyer, Oberhaching; Kurt Schluter, and Hermann Steggewentz, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Dec. 11, 1968, Ser. No. 783,784**

**Claims priority, application Germany, Dec. 12, 1967, P 16 14 677.3**

**Int. Cl. B44d 1/14; G03c 1/84; C23c 15/00**

**U.S. Cl. 117—45** **5 Claims**

Described is a contact exposure mask for selective exposure of photovarnish layers for semiconductor fabricating purposes. The contact exposure mask consists of a metallized layer which is deposited upon a carrier plate of transparent, hard material and is provided with exposure windows. The metallized layer is covered by a layer of transparent, hard material having a thickness of at most 3 microns.

3,644,135

## IN-SITU CARBIDING OF PYROLYZED COMPOSITES

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 18, 1968, Ser. No. 768,685
Int. Cl. C23c 3/04, 9/06; C03c 17/20
U.S. Cl. 117—46 5 Claims

Ablation-resistant compositions for use in high-temperature environments produced by impregnating bundles of carbonaceous filaments with an organometallic compound of a refractory metal followed by pyrolysis and carburizing to thereby form the refractory metal carbide in uniformly dispersed form throughout the bundles of carbonaceous filaments.

3,644,136

## PROCESS FOR IMPROVING THE ADHESION OF POLYESTER FIBROUS MATERIAL TO RUBBER

Robert W. McCullough, Riverside, Conn., assignor to Collins and Aikman Corporation, New York, N.Y.

Filed Nov. 4, 1969, Ser. No. 874,043
Int. Cl. B44d 1/092; B32b 25/08
U.S. Cl. 117—47 A 8 Claims

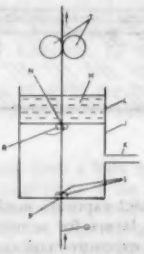
Polyester fibrous materials are provided which have improved adhesion to rubber. The polyester fibrous materials of this invention are obtained by treating the polyesters in the form of fibers, filaments, yarns or fabrics with halogenated aromatic hydrocarbon at an elevated temperature for a short period of time and then advantageously removing substantially all of the halogenated aromatic hydrocarbon from the treated material. The polyester fibers prepared in accordance with this invention are especially useful as reinforcement for rubber products such as tires, conveyor belts and the like.

3,644,137

## METHOD OF APPLYING PROCESSING LIQUORS TO TEXTILE MATERIALS AND APPARATUS THEREFOR

Maurice Rayner Fox; Neil David Stewart, and Alfred Peter Lockett, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 9, 1967, Ser. No. 673,647
Claims priority, application Great Britain, Oct. 10, 1966, 45,197/66
Int. Cl. D06p 7/00
U.S. Cl. 117—61 5 Claims



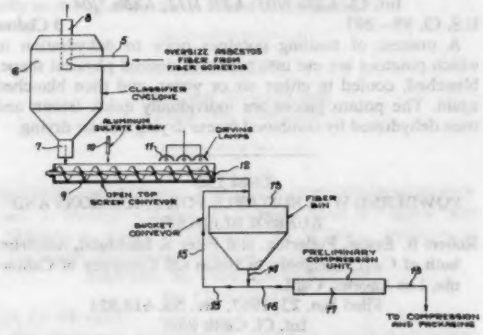
A method for impregnating fibrous materials with processing liquors, such as dye liquors, comprising the steps of (1) subjecting the fibrous material to a subatmospheric pressure, (2) bringing the processing liquor and the fibrous material into mutual contact, (3) restoring the pressure on the material to atmospheric pressure. An apparatus for performing the method having an evacuation chamber for the fibrous material, means for bringing the processing liquor and the material into mutual contact and means for restoring the pressure on the material to atmospheric pressure.

3,644,138

## METHOD FOR PREPARING AN ASBESTOS FIBER PRODUCT OF IMPROVED FILTRATION CHARACTERISTICS

Charles E. Stiefken, Westfield, N.J., assignor to American Smelting and Refining Company, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,754
Int. Cl. C03c 25/02
U.S. Cl. 117—100 S 7 Claims



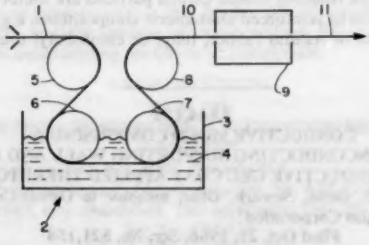

Asbestos fiber having aluminum sulfate deposited on its surfaces and especially well suited for forming fast-filtering asbestos-cement slurries, the preparation of such fiber, and the production of water-laid asbestos-cement products involving the formation of the fast-filtering asbestos-cement slurries utilizing the asbestos fiber having the aluminum sulfate previously deposited thereon. Such asbestos fiber product is preferably dry but can be only partially dry or wet.

3,644,139

## OPAQUE POLYMER FILM AND METHOD OF PRODUCING

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1969, Ser. No. 889,530
Int. Cl. B44d 5/12
U.S. Cl. 117—118 16 Claims




An opaque microporous thermoplastic film useful as paper including printing paper. The film contains dispersed throughout it microscopic voids. The voids are apparently created by the shrinking of globules of a reaction product of

an organic anhydride introduced into the film in the fused or dissolved state of the polymer and then reacted with an agent capable of acylation.

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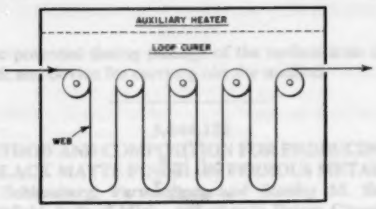
3,644,140

## METHOD FOR RENDERING CELLULOSIC MATERIALS FLAME RETARDANT

Herman S. Weisz; Bernard Scheffler, and Lester W. Neely, all of Rock Hill, S.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Apr. 17, 1970, Ser. No. 29,480
Int. Cl. B44d *1/46*; C09k *3/28*
U.S. Cl. 117—119.6 6 Claims




The invention provides a teaching of method and apparatus for utilizing certain substituted phosphono-amide flame retardant containing compositions on cellulosic materials in a manner effective for mass production by continuous movement of the material. In particular, the invention utilizes apparatus which avoids sticking of the material to any conveying means during curing in the utilization of a festoon- or loop-curing-type oven. A critical material temperature range during curing has been found to be particularly effective in the process disclosed herein and the curing may be assisted by means of an auxiliary heater to render certain the maintenance of a predetermined temperature in the material itself as it passes through the oven.

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3,644,141

## METHOD OF DISPERSING REACTION OF ORGANOSILANE AND POLYOLEFIN

Jerome A. Preston, Fort Wayne, Ind., assignor to Owens-Corning Fiberglas Corporation

Filed Dec. 5, 1968, Ser. No. 781,618
Int. Cl. C03c *25/02*
U.S. Cl. 117—126 GS 9 Claims

A method of dispersing polyolefins in water and a resulting product useful as a coating material for glass fibers. Glass fibers coated with the products and mixed with polyolefin molding resins produce molded parts having increased strength. The polyolefin material is combined with an organosilane and the combination is then mixed with a water dispersible polyester material which acts as a carrier for the polyolefin-silane material during a subsequent emulsification or dispersing operation.

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3,644,142

## PROTECTIVE GARMENT AGAINST WHITE PHOSPHORUS

Francis Clyde Rauch, Stamford, Conn.; Michael Albert Murray, White Plains, N.Y., and Richard Vincent O'Lenick, Parsippany, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 11, 1968, Ser. No. 783,152
Int. Cl. B32b *27/20*; A62b *17/00*
U.S. Cl. 117—138.8UF 5 Claims

Protective garment fabric impervious to burning phosphorus is made with fibrillated polytetrafluoroethylene containing an incorporated copper adjuvant which consists of metallic copper or a copper compound, e.g., copper sulfate, cuprous or cupric oxide and the like. The fabric comprises 10 to 95 percent weight of the copper adjuvant. In preferred embodiments the fabric may also include inorganic fibers, e.g. asbestos. Incorporated polytrifluorochloroethylene improves strength of the fabric. Protective garments can be fashioned from the new fabrics.

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3,644,143

## LUBRICATING COMPOSITION

Alexander Campbell Flett, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 5, 1968, Ser. No. 750,021
Claims priority, application Great Britain, Aug. 11, 1967, 37,029/67
Int. Cl. D06m *13/00*
U.S. Cl. 117—138.8 N 1 Claim

A polyamide yarn-lubricating composition of particular value to yarns that are to be subjected to a false-twisting operation which comprises in dispersion a volatile aliphatic ester (A), optionally a volatile oil-soluble surfactant (B), an anionic surfactant (C), that is different from (B) if (B) is present and an antistatic agent (D).

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3,644,144

## COATED ELECTRODE FOR ELECTRIC ARC WELDING OF STEEL OF VARIOUS STRUCTURE

Mikhail Mikhailovich Timofeev, ulitsa Velozavadskaya, II/I, kv. 323, Moscow; Vladimir Leonidovich Sokolov, ulitza Komsomolskaya 5, kv. 96, Reutovo, Moskovskaya Oblast; Samuil Iosifovich German, ulitsa Mayakovskogo, II, kv. 21; Ninel Efimovna Levenberg, ulitsa Galana, 3, kv. 58, both of, Kharkov, and Nikolai Ivanovich Popov, ulitsa Kovskkova 8/50, kv. 36, Elektrostal, Moskovskaya Oblast, all of U.S.S.R.

Filed July 24, 1970, Ser. No. 58,208
Int. Cl. B23k *35/22*
U.S. Cl. 117—205 1 Claim

The present invention relates to welding coated electrodes and is used for welding steel of various structure.

The electrode comprises a rod containing carbon, silicon, manganese, molybdenum, nickel, titanium and iron, and a coating of the fluoric-calcium type.

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3,644,145

## INCORPORATION OF VALVE METALS INTO CURRENT-PRODUCING CELL CONSTRUCTIONS

Anthony Vincent Fraioli, Essex Falls, N.J., and John Phillip Mohns, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 2, 1969, Ser. No. 863,347
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 13 Claims

In electrochemical current-producing cells having nonaqueous electrolyte solutions, metal parts of the positive electrode which contact the electrolyte are of a valve metal, e.g., aluminum, coated with a corrosion-resistant film of the valve metal oxide.

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3,644,146

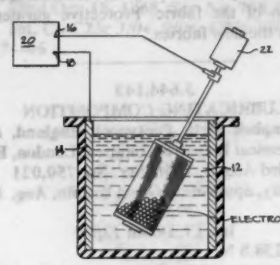
## METHOD FOR CYCLING BATTERY ELECTRODES IN BULK

Bernard G. Bergum, Monona, Wis., assignor to ESB Incorporated

Continuation-in-part of application Ser. No. 703,296, Feb. 6, 1968, now abandoned. This application Mar. 23, 1970, Ser. No. 21,850
Int. Cl. H01m *35/30*
U.S. Cl. 136—76 12 Claims

Battery electrodes are cycled in bulk in a conductive container by depositing the container in an electrolyte (or alternatively, by depositing the electrolyte in the container) and

then passing a current between the container and another conductor present in the electrolyte. The electrodes are then removed from the container and assembled into batteries.




Preferably the electrodes are agitated while the current is being passed. Cylindrical rotating containers may be used for the cycling.

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**3,644,147**

**MIXED VALENCY TRANSITION METAL PEROVSKITES AS CATHODIC REDUCTION CATALYSTS**

**Archie R. Young, II, Montclair, N.J., assignor to Esso Research and Engineering Company**

**Filed Apr. 24, 1969, Ser. No. 819,107**

**Int. Cl. H01m** *27/04, 13/00*

**U.S. Cl. 136—86 D** **6 Claims**

Ionic crystals having a perovskite structure and comprising a solid solution of oxides of the formulas $ABO_3$ and $A'BO_3$ where A and A′ are nontransition metals and B is a transition metal present in two different valency states are effective cathodic electrocatalysts for use in electrochemical cells such as fuel cells.

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**3,644,148**

**METHOD OF PLACING AND HOLDING A FUEL-CELL BATTERY IN INACTIVE MAINTENANCE-FREE READY CONDITION**

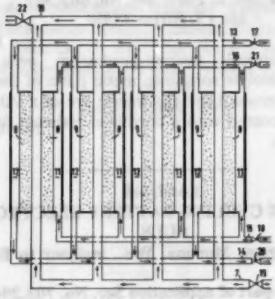
**Heinrich Gutbier, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Aug. 19, 1969, Ser. No. 851,232**

**Claims priority, application Germany, Aug. 28, 1968, P 17 96 080.4**

**Int. Cl. H01m** *27/00*

**U.S. Cl. 136—86 E** **4 Claims**



Method of placing and holding in inactive maintenance-free ready condition a fuel-cell battery having electrode chambers, respective electrodes in the chambers, and respective supply means for two reactants, namely fuel and oxidant, the supply means having respective inlet valves for controlling the supply of the reactants, includes the steps of displacing one of the reactants of the electrodes and electrode chambers by filling the electrodes and electrode chambers with nonreactant substance, closing the inlet valve for the one reactant and holding the valve closed during the inactive-and-ready state of the battery.

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**3,644,149**

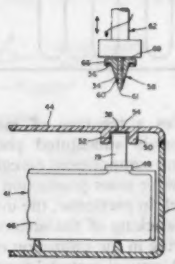
**BATTERY TERMINAL CONSTRUCTION AND METHOD FOR FORMING BATTERY TERMINALS**

**James P. Coffey, Hatboro, and Frank A. Vengrofski, Rockledge, both of Pa., assignors to ESB Incorporated**

**Filed June 22, 1970, Ser. No. 47,989**

**Int. Cl. H01m** *5/00*

**U.S. Cl. 136—135 S** **18 Claims**



Batteries are described having battery posts disposed wholly within the battery container. Terminal inserts are installed through the walls of the battery container and into the posts within by a method combining high-speed rotation and pressure. The terminal inserts make permanent electrical and mechanical contact with the interior battery posts and provide external electrical contact means. Means are described to lock the wall of the container to the post and insert and provide a liquidtight seal therebetween.

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**3,644,150**

**STABILIZING OF AQUEOUS SOLUTIONS OF POTASSIUM PERSULPHATE**

**Joris Jan Cornelis Oomen, and Jan Adrianus Visser, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 7, 1969, Ser. No. 874,962**

**Int. Cl. H01m** *15/04*

**U.S. Cl. 136—137** **7 Claims**

Aqueous solutions of potassium persulfate may be stabilized by a sulfonic acid salt.

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**3,644,151**

**METHOD AND DEVICE FOR CRUCIBLE-FREE ZONE MELTING A CRYSTALLINE ROD**

**Wolfgang Keller, Pretzfeld, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Mar. 13, 1970, Ser. No. 19,290**

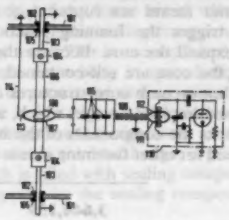
**Claims priority, application Germany, Mar. 19, 1969, P 19 13 881.9**

**Int. Cl. B01j** *17/10*

**U.S. Cl. 148—1.6** **10 Claims**

Method of crucible-free zone melting a crystalline rod, such as a semiconductor rod especially, wherein the rod is surrounded by an induction heating coil energizable so as to form a molten zone in the rod, includes passing the molten

zone axially through the rod, and simultaneously maintaining the crystalline rod and the induction heating coil at the same



electric potential during passage of the molten zone through the rod; and device for carrying out the method.

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3,644,152

## METHOD AND COMPOSITION FOR PRODUCING A BLACK MATTE FINISH ON FERROUS METALS

Louis Schlossberg, Farmington, and Stanley M. Sokalski, Southfield, both of Mich., assignors to Detrex Chemical Industries, Inc., Detroit, Mich.

Filed Oct. 21, 1969, Ser. No. 868,218
Int. Cl. C23f 7/10
U.S. Cl. 148—6.15 R 8 Claims

A method is provided for producing a black matte finish on ferrous metal objects, wherein the ferrous metal object is contacted with a sulfuric acid solution of a trivalent antimony salt and a complexing agent and thereafter a phosphate coating is deposited on the object. The treating solution may also contain a minor amount of hydrochloric acid or a salt of hydrochloric acid. The finish produced on the ferrous metal is of a uniform black stable shade.

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3,644,153

## ABRASION-RESISTANT MATERIALS AND CERTAIN ALLOYS THEREFORE

John J. Rausch, Antioch, and Ray J. Van Thyne, Oak Lawn, both of Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

Filed Jan. 28, 1970, Ser. No. 6,379
Int. Cl. C22c 27/00; C23c 11/14
U.S. Cl. 148—31.5 12 Claims

A novel group of alloys consisting essentially of:

A. columbium and/or tantalum and/or vanadium;
B. titanium and/or zirconium;
C. chromium and/or manganese and/or rhenium; and optionally,
D. molybdenum and/or tungsten.

Such alloys illustrate utility in themselves and when nitrided as hereinafter taught are characterized by excellent wear and abrasion resistance and show considerable utility, for example, as cutting tool materials.

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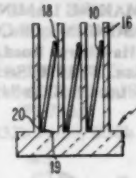
3,644,154

## METHOD OF FABRICATING SEMICONDUCTOR STRUCTURES WITH REDUCED CRYSTALLOGRAPHIC DEFECTS

Cornelius Hoogendoorn; Mattie Moody, and Guenter H. Schwuttke, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 9, 1969, Ser. No. 831,675
Int. Cl. H01l 7/44
U.S. Cl. 148—187 6 Claims

A method of fabricating semiconductor structures and devices with reduced crystallographic defects by supporting said wafers in close proximity to a substrate which serves to maintain a linear temperature gradient across the surface of the wafer. The wafer is positioned so that one entire surface thereof is less than one-fourth inch and may be flush against the substrate which has a heat capacity of at least 10 times that of the wafer. The wafer is maintained in this position whenever it is at a temperature above 850° C. The wafer is so




maintained during both the periods when such high-heat processing is being carried out, as well as when the wafer is removed from the source of heat and being cooled.

There is also provided a wafer holder having a plurality of spaced walls and means for supporting a plurality of wafers in the above-described positions between said walls.

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3,644,155

## CLEANING AND BRIGHTENING OF LEAD-TIN ALLOY-RESISTED CIRCUIT BOARDS

Bernard James Hogya, Sayreville, N.J., and Joseph Thomas McManamon, Levittown, Pa., assignors to FMC Corporation, New York, N.Y.

Filed May 1, 1969, Ser. No. 821,088
Int. Cl. C23g 1/06; C23f 3/04
U.S. Cl. 156—20 6 Claims

Etched copper circuits having a solder-plated resist are cleaned and brightened by contacting the solder surface with hydrobromic acid.

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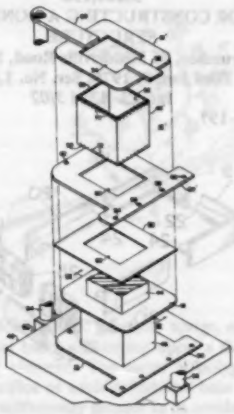
3,644,156

## METHOD OF MAKING A COIL BOBBIN

Emerick J. Petrinjak, Masury, Ohio, and William J. Grasinger, Stoneboro, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1969, Ser. No. 857,962
Int. Cl. B29d 3/00; H01f 27/02, 27/28
U.S. Cl. 156—90 2 Claims



A method of making coil bobbins wherein a plurality of bobbins are assembled on an upstanding guide form, while simultaneously gauging the length dimension between the

flanges of each bobbin, gauging the squareness of the flanges to the longitudinal dimension of the bobbins, and regauging the openings in the tubular member of each bobbin to its original as formed configuration.

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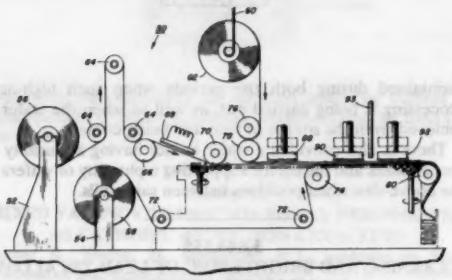
**3,644,157**
**METHOD OF MAKING LAMINAR GARMENT BY AUTOGENOUS BONDING OF CONTINUOUS WEBS**
**Neal M. Draper, 25 Hawthorne Road, Short Hills, N.J.**
**Filed Jan. 27, 1970, Ser. No. 6,155**
**Int. Cl. B32b *31/00***
**U.S. Cl. 156—160** **4 Claims**



A laminar garment comprising a first layer of finished material, a second layer of finished material and an intermediate layer of elastic material disposed between the first and second layers of finished material is disclosed as being manufactured by a process wherein the first layer of finished material and the intermediate layer of elastic material are bonded together at selected points, thereafter the second layer of finished material is positioned adjacent the intermediate layer of elastic material and bonded to both the first layer of finished material and the intermediate layer of elastic material at points other than the points of initial bonding between the first layer of finished material and the intermediate layer of elastic material. The method of bonding is disclosed as being heat-pressure bonding, the elastic material being heat-pressure sealable material such as polyester urethane foam.

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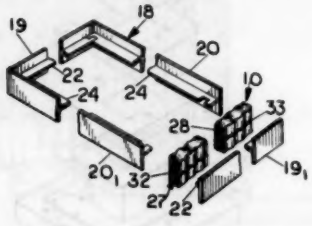
**3,644,158**
**METHOD FOR CONSTRUCTING A HONEYCOMB CORE STRUCTURE**
**William P. Strumbos, 85 Middleville Road, Northport, N.Y.**
**Filed Jan. 9, 1970, Ser. No. 1,698**
**Int. Cl. B31d *3/02***
**U.S. Cl. 156—197** **10 Claims**




In the art of constructing honeycomb core structures, a method for treating the honeycomb core material during the manufacturing process with a self-contained force-generating substance such that it can be shipped in the unexpanded condition and can be expanded when required by activating the substance. The force-generating substance is a stable, but potentially reactive, foamable material coated on the walls of the unexpanded core cells with the reactants of the material isolated from one another by impermeable barrier means. These barrier means are ruptured or dissolved by suitable means to trigger the foaming reaction that provides the forces to expand the core. Because the foamable means for expanding the core are self-contained, and can be remotely activated, honeycomb core structures can be produced having a foamed-in-place core in which, also, the expansion of the core locks the components of the structure together such that the need for other fastening means is thereby eliminated.

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**3,644,159**
**METHODS FOR MANUFACTURING CORRUGATED BOARD**
**Ake Evald Edkvist, Lockarp, Sweden, assignor to Palson Corporation AB, Malmo S, Sweden**
**Filed June 13, 1967, Ser. No. 645,673**
**Claims priority, application Sweden, June 20, 1966, 8371**
**Int. Cl. B31f *1/28***
**U.S. Cl. 156—210** **7 Claims**

A method and an apparatus for manufacturing corrugated board in which layers of material for the corrugated board are coated with a mixture of a thermoplastic and a wax which can be brought into liquid form and which after melting and setting on the layers keeps said layers together.

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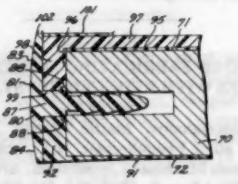
**3,644,160**
**METHOD OF MAKING MULTILAYER ARTICLES**
**James R. Valentine, Jr., Orange, and Ralph C. McBee, Fountain Valley, both of Calif., assignors to Comatico Tiles, Inc., Artesia, Calif.**
**Filed June 26, 1968, Ser. No. 740,279**
**Int. Cl. B32b *31/00***
**U.S. Cl. 156—250** **15 Claims**



A method of making multilayer articles having a flat frame board wherein each of the faces of the frame board receive a sealing coat and, after a dam is formed around the perimeter of the board, one of the board faces receives a color coat which is considerably thicker than the respective seal coat,

which color coat has veins of a contrasting color formed therein, and then a final coat is applied over the color coat, said frame board being cut, in some cases, to the final shape of the article before said coats are applied. The method also effects a seal at the edge of the frame board where an edge mold is located, even though the sealing compound used will not adhere to the edge mold. This is accomplished by providing that the edge mold main body is spaced slightly away from the board edge to permit the sealing compound to fill the space between the board edge and the main body of the edge mold and providing that the edge mold anchor flange, which is received in a slot in the board edge, is provided with a recess thereon which is filled with sealing compound to effect a mechanical gripping by the sealing compound on the edge mold.

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**3,644,161**

**PROCESS FOR CURING AIR-INHIBITED RESINS BY RADIATION**

**Roger P. Hall, Mayfield Heights, Ohio, assignor to SCM Corporation, Cleveland, Ohio**

**Filed Nov. 13, 1967, Ser. No. 682,140**
**Int. Cl. B29c *19/02***
**U.S. Cl. 156—272** **12 Claims**

A process for curing a normally air-inhibited, thermosetting resinous reaction product comprising exposing a film or coat of the resin while overlying a substrate to high-energy radiation to cure at least a depthwise segment of the film that is contiguous to the substrate to provide a nontacky, mar-resistant undersurface to the film, then inverting the film on a substrate, and again exposing the inverted film to high energy radiation or to heat. Electron emission, microwaves, ultraviolet light, and the like may be used as the high-energy radiation. As a modification, the resin film or coat may be stretched prior to completing the second exposure. As a further modification, the resin film may be laminated to a substrate during the second exposure, preferably with an adhesive curable by exposure to such high energy radiation.

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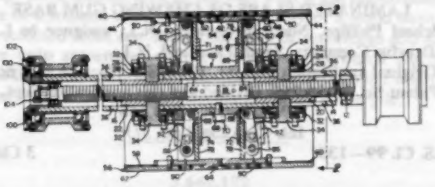
**3,644,162**

**TIRE-BUILDING DRUM**

**Paul E. Appleby, Silverlake; Denver C. Folden, Akron, and Robert S. Riggs, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed July 6, 1970, Ser. No. 52,232**
**Int. Cl. B29h *17/16***
**U.S. Cl. 156—415** **12 Claims**



A tire-building drum of the collapsible type having a plurality of segments which, in the expanded condition of the drum, collectively form a tire-building surface. Radial movement of the segments between the expanded and collapsed condition of the drum is controlled by two sets of links one of which set has a through center toggle action as the segments associated therewith move into or out of expanded condition. The segments are guided in their radial movement by pistons mounted on the segments and received in cylinders which are fixed relative to the drum shaft. In the expanded condition of the drum, the links are contained within the pistons to provide a compact structure.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

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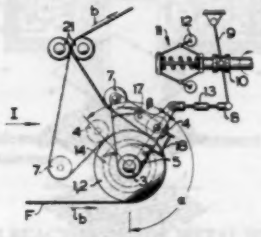
**3,644,163**

**WELDING APPARATUS**

**August Schwarzkopf, and Fritz Achelpohl, both of Westphalia, Germany, assignors to Windmoller & Holscher, Westphalia, Germany**

**Filed Sept. 10, 1969, Ser. No. 856,563**
**Claims priority, application Germany, Sept. 18, 1968, P 17 79 733.0**
**Int. Cl. B32b *31/20*; B30b *15/34***
**U.S. Cl. 156—583** **9 Claims**



Apparatus for forming a longitudinal seam in heat sealable layers of a traveling web of material comprising a rotatable guide roll extending longitudinally the width of the web to be sealed, the guide roll being provided on its periphery at one end with a striplike heating element, and a pressure roll to press the web against the heat element located where the web leaves the surface of the guide roll, the pressure roll longitudinally extending only over the region of the heating element.

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**3,644,164**

**PLASTIC GREENERY STRIPS FOR DECORATIVE PURPOSES**

**Wesley S. C. Chin, P.O. Box 8412 Crenshaw Station, Los Angeles, Calif.**

**Filed July 27, 1970, Ser. No. 58,219**
**Int. Cl. A41g *1/00***
**U.S. Cl. 161—25** **5 Claims**

A series of molded plastic greenery sprigs, each having an orificed cylindrical base, are strung upon a flexible longitudinally extending element. The latter is polygonal in cross section and the orifice of each cylindrical base is of a similar cross section but sufficiently greater in its inside dimension to permit the element to be passed therethrough in a mating fit. In one form, the flexible element may be a plastic jacketed wire. In assembling the sprig onto the longitudinally extending element, its angular orientation relative to the axis of the element and to other sprigs slipped onto the same element

may be varied. The polygonal configuration of the element prevents any rotation of the sprig base after it is assembled onto the element.

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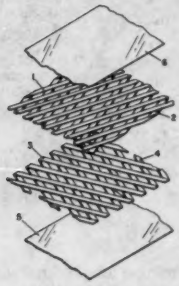
3,644,165

**FIBER REINFORCED LAMINATED PLASTIC FILM AND METHOD OF MAKING SAME**

Wei-Gwo Chen, Houston, Tex., assignor to Griffolyn Company, Incorporated

Filed Oct. 15, 1969, Ser. No. 866,599
Int. Cl. B32b *5/08*
U.S. Cl. 161—58 10 Claims



An improved fiber reinforced laminate, in which the nonwoven reinforcement is oriented in four different planes, each of the four containing fibers parallel with each other. Describing the construction in another way, it consists essentially of two diamond patterns superimposed on each other, one of which has its longer diagonals parallel with the longitudinal direction of the laminate (the machine direction), and the other has its shorter diagonal parallel with this direction. The invention also contemplates a method for mass producing this laminated article, by means of modulating the speed of the fiber angularizing means of the laminate producing machine.

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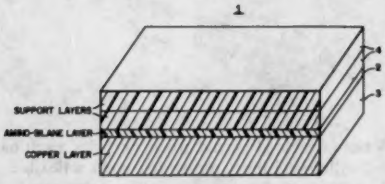
3,644,166

**OXIDE-FREE MULTILAYER COPPER CLAD LAMINATE**

Smith A. Gause, Hampton, S.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1968, Ser. No. 716,819
Int. Cl. H05k *1/00*; B32b *15/08*
U.S. Cl. 161—89 9 Claims




A copper-clad laminate is made with a copper foil, an intermediate thin film of an amino-silane applied over the copper surface and layers of a resin impregnated support material. The amino-silane film uniformly covers the copper surface and prevents oxide transfer to the support material.

3,644,167

**PREPARATION OF CORRUGATING LINERBOARD**

Warren E. Mowry, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed July 14, 1969, Ser. No. 841,578
Int. Cl. D21h *1/04, 3/28*
U.S. Cl. 161—125 10 Claims

A corrugating linerboard is prepared from a paperboard made from waste paper fiber by surface sizing the paperboard with an aqueous solution of 5 to 30 weight percent solids concentration of an alkali metal borate treated mixture of lignosulfonate and starch. The starch is present in the mixture in an amount of from 15 to 25 weight percent of the lignosulfonate solids and the mixture is treated with the alkali metal borate in an amount of from 1 to 5 weight percent of the lignosulfonate solids.

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3,644,168

**VARIED DENSITY POLYISOCYANURATE FOAM STRUCTURE**

Henry W. Bonk, Wallingford; Robin L. Grieve, North Guilford; Herbert G. Nadeau, North Haven, and Peter G. Palmer, Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 798,103, Feb. 10, 1969. This application June 12, 1970, Ser. No. 45,756
Int. Cl. B32b *3/26, 5/14*; B29d *27/00*
U.S. Cl. 161—160 11 Claims

A novel structural material is described. The material is a rigid cellular polymer having an integrally formed continuous noncellular surface layer. There is an abrupt change of density at the juncture of the inner cellular core and the outer noncellular layer, the thickness of the latter being not less than about 0.25 millimeters. The inner cellular core and the outer noncellular layer are of uniform chemical composition and comprise a polymer having isocyanurate moieties as the major recurring chemical linkages and oxazolidinone, amide, imide, and urethane moieties as minor recurring units. Optionally the novel structural material can contain fillers and/or reinforcing elements. The novel structural material is further characterized by high-insulating capacity, high-structural strength and high resistance to heat and to flame spread. It can be used in place of sheet metal, wood, reinforced resin and the like, in the fabrication of automobiles, appliances, furniture, buildings, marine vessels, sporting goods equipment, pipe insulation, and many allied fields.

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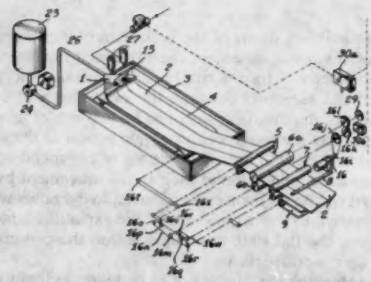
3,644,169

**LAMINATED SLABS OF CHEWING GUM BASE**

Michael Phillips, North Brunswick, N.J., assignor to L. A. Dreyfus Company, South Plainfield, N.J.

Original application Dec. 31, 1963, Ser. No. 334,870, now Patent No. 3,455,755. Divided and this application Sept. 9, 1968, Ser. No. 774,558
Int. Cl. A23g *3/00, 3/30*
U.S. Cl. 99—135 3 Claims



A laminated chewing gum base slab comprising a ribbon of chewing gum base in which the ribbon is folded in accordion

fashion with the faces of separate folds adhered together. The adjacent faces of some folds can be separated by a nonadherent layer.

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**3,644,170**

**FIBRILATING FIBROUS PULP STOCK IN A GAS STREAM**

**Teizo Mekata, 3474, Showa-dori; Takashi Yoda, and Masaharu Shiraishi, both of 579/41 Ishizaka, all of Yoshiwara, Shizuoka-ken, Japan**

**Continuation-in-part of application Ser. No. 598,407, Dec. 1, 1966, now abandoned. This application Dec. 10, 1969, Ser. No. 883,947**

**Claims priority, application Japan, June 18, 1966, 41/39219**

**Int. Cl. D21d *1/38***

**U.S. Cl. 162—21** **11 Claims**

Pulp stock in the form of dehydrated pulp flakes having a moisture content of between 20 and 50 percent is entrained in an airstream and is fed into a fibrilator where it is subjected to a three-dimensional turbulent flow resulting from the unidirectional propulsive force of the airstream and centrifugal force caused by rotating blades within the fibrilator. The flakes impinge upon one another and when disintegrated are withdrawn from the fibrilator by the unidirectional force of the airstream. The less fully disintegrated flakes undergo mechanical impact with a toothed surface in the fibrilator and are then withdrawn. The temperature of the airstream may be controlled by a heat exchanger and the moisture content thereof by valved water and steampipes connected to the airstream carrying duct upstream of the fibrilator.

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**3,644,171**

**PROCESS FOR PREPARING A WOOD CHIP PILE FOR DIGESTION BY COATING THE PILE WITH A GAS IMPERMEABLE LAYER AND PRODUCTS THEREOF**

**Rhys Dilwyn Bevan, 245 Springhill Road, Rosemore, Quebec, Canada, and Ingemar Liss-Albin Croon, S. Aspgatan 1, Alfredshem, Ornskoldsvik, Sweden**

**Filed July 7, 1969, Ser. No. 839,674**

**Claims priority, application Great Britain, July 12, 1968, 33,275/68**

**Int. Cl. D21c *3/04***

**U.S. Cl. 162—70** **7 Claims**

Wood chips, at least 1 percent of which, by volume are impregnated with a cooking liquor are cooked while stored in the form of a pile. The pile is characterized by being coated, except for a limited area at the top, with a gas impermeable layer of a foamed resin or of an admixture of a wood derivative selected from saw dust, kraft pulp or screenings and sulphite pulp screenings with a binding agent which can be cross-linked to form a gel. The coating facilitates the control of the temperature and the circulation of air in the pile.

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**3,644,172**

**SYSTEM FOR DETERMINING LEAKAGE INSIDE A REACTOR CONTAINMENT**

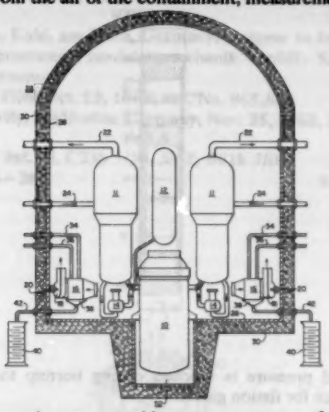
**Donald A. Campbell, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 23, 1968, Ser. No. 761,638**

**Int. Cl. G21c *17/00***

**U.S. Cl. 176—19 LD** **6 Claims**

The invention provides a system for determining the total leakage of steam and water systems inside a reactor containment by measuring the condensate collected by the containment cooling coils. The leakage from the system is present in the containment as vapor, either directly or by subsequent evaporation from the liquid state, is transported by air circulated within the containment and removed by condensation at the cooling coils of the air recirculation system. As equilibrium normally exists between vapor addition to and removal from the air of the containment, measurement of the



collected condensate provides measurement of leakage within the containment.

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**3,644,173**

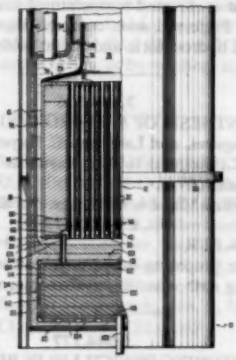
**NUCLEAR REACTOR OF THE METAL HYDRIDE CONTROL TYPE**

**Robert E. Magladry, Baltimore, Md., assignor to Teledyne, Inc., Los Angeles, Calif.**

**Filed Nov. 6, 1967, Ser. No. 680,618**

**Int. Cl. G21c *7/00***

**U.S. Cl. 176—42** **21 Claims**



A nuclear reactor comprising thermally isolated first and second sealed containers carrying metal hydride, one of which also includes nuclear fuel material with the metal hydride material forming essentially the reactor core, circulating coolant passages through the core containing container means for fluid connecting the sealed containers to allow intercontainer transfer of released hydrogen and means for heating the nonreactor core container to control reactivity within the reactor core.

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**3,644,174**

**PRESSURIZED FUEL ELEMENT**

**Harry M. Ferrari, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

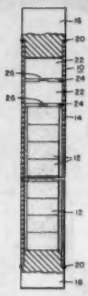
**Filed June 19, 1968, Ser. No. 738,237**

**Int. Cl. G21c *3/04***

**U.S. Cl. 176—68** **7 Claims**

A metallic clad sealed fuel element for a nuclear reactor is internally pressurized to resist creep collapse in the early

stage of burnup. The fuel element has a normally sealed plenum chamber which is rupturable when a predetermined



increased pressure is reached during burnup to provide a void space for fission gases.

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**3,644,175**

**DETOXIFICATION OF GRAM-NEGATIVE BACTERIA GROWN IN A FERMENTATION PROCESS**

**Bruce L. Dasinger, Scotch Plains, and Lars A. Naslund, Morganville, both of N.J., assignors to Esso Research and Engineering Company**

**Filed July 8, 1968, Ser. No. 743,012**
**Int. Cl. C12d *13/06***
**U.S. Cl. 195—28 R** **7 Claims**

The present invention is concerned with the detoxification of gram-negative bacteria produced in an aerobic biosynthesis fermentation process. It is preferred that the detoxification be carried out at elevated temperatures using an inorganic or organic acid. Preferred acids comprise inorganic and organic acids, such as hydrochloric and acetic acids.

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**3,644,176**

**SYNTHESIS OF 6-HYDROXYNICOTINE**

**William C. Squires, and Lawrence E. Hayes, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

**Filed May 14, 1969, Ser. No. 824,498**
**Int. Cl. C12d *13/00***
**U.S. Cl. 195—51 R** **8 Claims**

Process for preparing 6-hydroxynicotine by conversion of nicotine using Arthrobacter oxydans micro-organisms.

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**3,644,177**

**MONITORING PENICILLIN IN BIOLOGICAL SUBSTANCES**

**Naomi Zyk, Jerusalem, Israel, assignor to Yissum Research Development Company, Jerusalem, Israel**

**Filed Nov. 12, 1969, Ser. No. 875,667**
**Int. Cl. G01n *31/14***
**U.S. Cl. 195—103.5 R** **17 Claims**

A method of determining the penicillin content in biological, metabolic, and alimentary substances by partially inactivating penicillinase with iodine in the presence of and in proportion to the amount of a penicillin contained in a specimen, and measuring the residual activity of the enzyme by contact with a suitable substrate such as an S-type penicillin in the presence of an indicator whose color change signifies accumulation of the hydrolyzate penicillinoic acid and is correlated in terms of time or hue to a standardized amount of the penicillin under test. Monitoring strips for carrying out the procedure consisting of 2 sorbefacient pads one of which is impregnated with the test enzyme while the other is suffused with an S-type penicillin and an indicator which may be a soluble starch-iodine complex or a pH-sensitive organic dye.

**3,644,178**

**AROMATIC ESTER RECOVERY**

**Albert J. Shmidl, Crosby, and Edgar C. Winegartner, Baytown, both of Tex., assignors to Esso Research and Engineering Company**

**Filed June 12, 1969, Ser. No. 832,843**
**Int. Cl. C07c *67/06***
**U.S. Cl. 203—29** **4 Claims**

In the recovery of aromatic esters, a product of improved color is obtained when heated in the presence of antimony trioxide.

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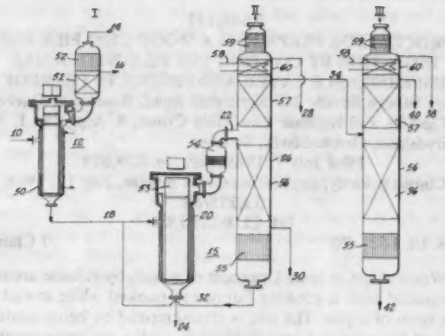
**3,644,179**

**METHOD AND APPARATUS FOR CONTINUOUS FRACTIONATION OF TALL OIL AND SIMILAR MIXTURES OF ORGANIC SUBSTANCES WITH PRELIMINARY PLURAL STAGE THIN FILM EVAPORATION**

**Peter Knoer, Zurich, Switzerland, and Gerhard Pleh, Krems an der Donau, Austria, assignors to Krems-Chemie Gesellschaft m.b.H., Krems an der Danube, Austria and Lurva A.G., Zurich, Switzerland**

**Filed Sept. 23, 1968, Ser. No. 761,774**
**Claims priority, application Austria, Sept. 28, 1967, A8825/67**
**Int. Cl. B01d *3/18***
**U.S. Cl. 203—72** **9 Claims**



Method and apparatus for continuous fractionation of tall oil and similar mixtures of organic substances containing components prone to react upon heating. One or more fractionating columns are utilized to separate the mixture into at least two main fractions, for example, a rosin acid fraction and a fatty acid fraction with a pretreating device comprising an evaporator, a fractionating column and a condenser. The evaporator of the pretreating device and the evaporator which precedes the first fractionating column are both thin film evaporators whereby evaporation occurs so quickly as to avoid reaction of the components of the light and heavy ends of the mixture which are otherwise prone to react upon heating. Preferably, a pair of fractionating columns are utilized, the first serving as a rosin acid distilling column and the second serving as a fatty acid distilling column, with the bottoms from the first fractionating column being recycled to the evaporator which precedes the first fractionating column to subject the same to further evaporation and fractionation. Improved yield and improved quality of yield are found.

## 3,644,180
## METHODS OF USING INORGANIC RESISTS

Russell Burock, Allentown; David M. Swirsky, Minersville, and Robert A. Whitner, Allentown, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

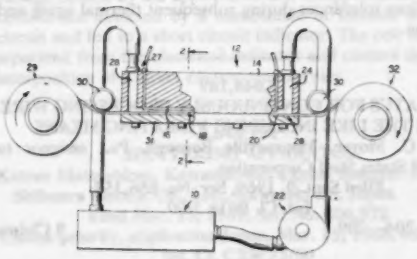
Filed Feb. 26, 1970, Ser. No. 14,478
Int. Cl. C23b *5/48*; B23p *1/00*; B01l *17/00*
U.S. Cl. 204—15 11 Claims

Chemical treatment of surfaces is limited to selected portions of the surface by applying inorganic resists to the surface in a desired pattern. In a specific example, silicon dioxide is deposited at a low temperature on a titanium surface surrounding a platinum interconnection pattern on a silicon semiconductor slice. The silicon dioxide is patterned to expose the platinum but cover the titanium. Gold is then electroplated onto the platinum in a well-defined pattern.

## 3,644,181
## LOCALIZED ELECTROPLATING METHOD

John G. Donaldson, Warren, Pa., assignor to Sylvania Electric Products Inc.

Filed July 24, 1969, Ser. No. 844,323
Int. Cl. C23b *5/48*, *5/58*; B01k *3/00*
U.S. Cl. 204—15 7 Claims

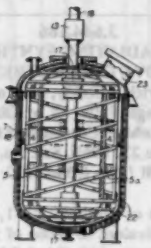


An improved electroplating process is disclosed wherein a metal is deposited in the form of a predetermined pattern upon a continuously advancing strip of electrically conductive substrate. The process involves providing a potential difference between an anode and a cathode wherein the cathode is the strip of electrically conductive substrate, and the current density at the cathode is at least about 300 amperes per square foot per feet per minute of the advance of the cathode, and circulating an electroplating solution containing the metal to be deposited between the anode and the cathode at a velocity of at least 6.5 ft./sec. at the cathode. In addition, an apparatus is disclosed that comprises a means of continuously advancing the strip of electrically conductive substrate past at least one electroplating station that comprises a housing having one face adapted for contact with the strip, an anode recessed in the housing, a channel having specific dimensions and connecting the anode and the strip and a pair of passages at opposite ends of the channel that are in close proximity to the channel, the passages have one end terminating at the face that is in contact with the strip and the other end terminating at a face other than the one that is not adapted for contact with said strip and a container for an electroplating solution and a means for circulating the electroplating solution through the electroplating station and a means for receiving the electroplated strip.

## 3,644,182
## PROCESS AND APPARATUS OF PLATING ENCLOSED VESSELS

Karl Wittel, Kahl, am Main, Germany, assignor to Industrie-Hartverchromung Praezisionsmechanik GmbH, Kahl, am Main, Germany

Filed Oct. 13, 1969, Ser. No. 865,805
Claims priority, application Germany, Nov. 25, 1968, P 18 08 865.8
Int. Cl. C23b *5/56*, *5/68*; B01k *3/00*
U.S. Cl. 204—26 9 Claims



The inside surfaces of pressure vessels are electroplated by mounting the anode within the vessel, continuously circulating electrolyte through the vessel and passing an electrolysis current from the anode to the wall of the vessel. Vessels having permanently mounted heads, as by welding, are uniformly plated.

## 3,644,183
## PROCESS FOR COATING AN OBJECT WITH A BRIGHT NICKEL/CHROMIUM COATING

Jules Marie Odekerken, Vught, Netherlands, assignor to N.V. Research Holland, 's-Hertogenbosch, Netherlands

Continuation-in-part of application Ser. No. 336,015, Jan. 6, 1964, now abandoned. This application Feb. 19, 1968, Ser. No. 706,619
Claims priority, application Netherlands, Jan. 9, 1963, 287612
Int. Cl. C23b *5/50*; C23c *3/02*
U.S. Cl. 204—38 B 10 Claims

Objects are coated with a basic bright nickel layer, an intermediate layer in which solid particles are embedded, and a chromium layer. The solid particles comprise particles of a solid, nonacid-resistant silicate which gives an alkaline reaction in aqueous suspension. The resulting composite coating has an outstanding corrosion resistance.

## 3,644,184
## ELECTROLYTIC GOLD PLATING SOLUTIONS AND METHODS FOR USING SAME

Paul T. Smith, Pascoag, and Augustus Fletcher, Coventry, both of R.I., assignors to Sel-Rex Corporation, Nutley, N.J.

Filed June 29, 1970, Ser. No. 50,969
Int. Cl. C23b *5/28*
U.S. Cl. 204—46 10 Claims

Electrolytic solutions containing gold and small amounts of thallium wherein the solution is neutral or alkaline yield uniformly deposited gold platings possessing good aesthetic qualities and having good attachability to surfaces. Thallium inclusion in the range of from about 1 to 140 milligrams per liter of solution are especially suitable.

3,644,185

## METHOD OF IMPROVING MAGNETIC PERMEABILITY OF CUBE-ON-EDGE ORIENTED, SILICON-IRON SHEET STOCK

James G. Benford, Monroeville Boro, and Edward B. Stanley, Washington Township, Westmoreland, both of Pa., assignors to United States Steel Corporation

Filed Nov. 10, 1969, Ser. No. 875,562
Int. Cl. C23b *1/00, 3/06*
U.S. Cl. 204—140.5 4 Claims

The method of improving the magnetic properties of conventional cube-on-edge oriented, silicon-iron sheet stock by providing the sheet with a light electropolish before or after the final high-temperature orientation anneal sufficient to substantially eliminate large microscopic peaks but insufficient to significantly enhance average surface smoothness.

3,644,186

## PROCESS FOR IRRADIATING SYNTHETIC RUBBER TO IMPROVE GREEN STRENGTH

Albert J. Gracia; Patrick J. Reilly, both of Akron, and Sandra J. Walters, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 27, 1968, Ser. No. 740,459
Int. Cl. C08l *1/00;* C08d *5/00;* C08f *1/88*
U.S. Cl. 204—159.2 5 Claims

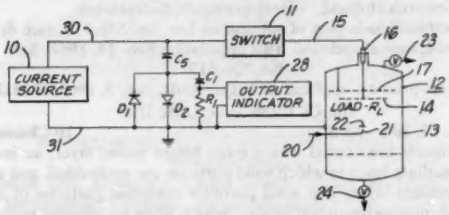
The green strength of synthetic cis-1,4 polyisoprene is increased to levels equivalent to those of natural rubber by irradiating the polyisoprene with 0.1–6.0 Mrads.

3,644,187

## INSTRUMENT FOR MEASURING CONDUCTANCE OR CAPACITANCE OF AN ELECTRICAL LOAD DURING OPERATION

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Original application Mar. 29, 1968, Ser. No. 717,346, now Patent No. 3,566,259, dated Feb. 23, 1971. Divided and this application June 15, 1970, Ser. No. 46,260
Int. Cl. B23c *5/00;* B03c *5/02*
U.S. Cl. 204—186 11 Claims



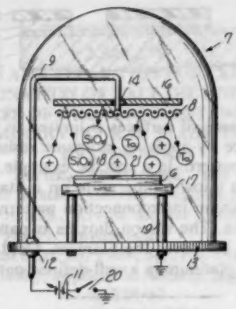

Instrumentation for measuring electrical characteristics of a load during application of stored electrical energy to the load. The current to the load is accurately monitored over a wide dynamic range. An instrument including a current source for charging a capacitance, a switch for discharging the capacitance through a diode into the load, and an RC circuit for developing an output signal which is the derivative of the voltage across the diode, with this output signal being directly proportional to the conductance of the load at any time during the discharge of the capacitance. A similar instrument for measurement of capacitance of a load. The instruments are suitable for the measurement of conductance and capacitance of an electric emulsion treater during operation of the treater.

3,644,188

## ANODIZABLE CERMET FILM COMPONENTS AND THEIR MANUFACTURE

Donald J. Sharp, Trenton, N.J., and Richard D. Sutch, Allentown, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 19, 1968, Ser. No. 776,962
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 29 Claims



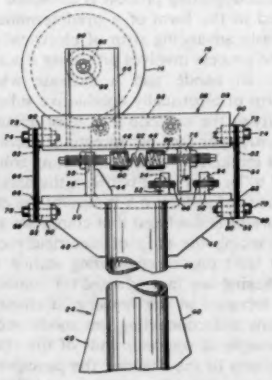

A film-forming metal and a ceramic are cosputtered on a glass substrate to form an anodizable cement film whose resistance, as measured between a pair of conductive terminals deposited thereon, is less than a predetermined value. The film is anodized electrolytically to increase or "trim," its terminal resistance to the predetermined value. Interaction between the ceramic and the anodically grown oxide of the film-forming metal during the anodizing step stabilizes the terminal resistance so that the trimmed value is maintained within close tolerances during subsequent thermal aging and operation.

3,644,189

## APPARATUS FOR CONTINUOUSLY PROCESSING WIRE OR THE LIKE INCLUDING VIBRATING MEANS

Robert C. Moyer, Monroeville Borough, Pa., assignor to United States Steel Corporation

Filed Sept. 9, 1969, Ser. No. 856,353
Int. Cl. B01k *3/00*
U.S. Cl. 204—209 9 Claims



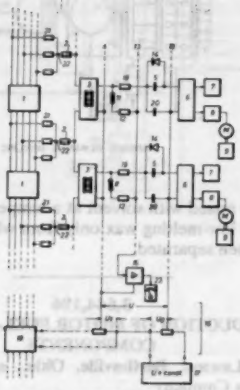

Apparatus for processing wire, strip or the like passing through a medium which reacts with the wire has means for vibrating the wire longitudinally without striking the wire so as to provide more efficient reaction.

3,644,190

## CIRCUIT ARRANGEMENT FOR INDICATING AND AUTOMATICALLY ELIMINATING SHORT CIRCUITS IN ELECTROLYSIS CELLS

Martin Weist, Leverkusen, and Walter Busing, Koeln-Stammheim, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 30, 1969, Ser. No. 837,675
Claims priority, application Germany, July 20, 1968, P 17 63 702.4
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 3 Claims



A circuit arrangement for indicating and automatically eliminating short circuits in electrolysis cells, particularly alkali metal chloride electrolysis cells. Alterations in the cell voltage caused by the appearance and disappearance of short circuits are detected by a monostable or bistable electrical circuit and fed to a short circuit indicator. The cell voltage is separated from the electrical indicator and control device by interposition of a direct current transformer.

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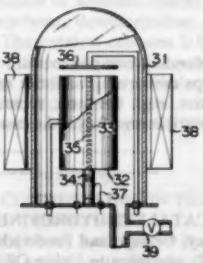
3,644,191

## SPUTTERING APPARATUS

Katsuo Matsushima, Kawasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 13, 1969, Ser. No. 806,972
Claims priority, application Japan, Mar. 15, 1968, 43/19904
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 4 Claims



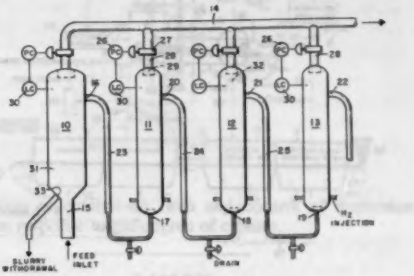

In a sputtering apparatus a plasma is formed between a cylindrical first electrode and a second electrode concentric with the first electrode. Either one of the electrodes is made of a material to be sputtered and the surface of the other electrode is covered by a thin film of the sputtered material.

3,644,192

## UPFLOW THREE-PHASE FLUIDIZED BED COAL LIQUEFACTION REACTOR SYSTEM

Sik U. Li, 42 Dorothy Drive, Morris Township, Morris County, N.J.; Edward Effron, 45 Fernhill Road, Springfield, N.J., and Robert M. Koros, 6 Faulkner Drive, Westfield, N.J.

Filed Aug. 28, 1970, Ser. No. 67,729
Int. Cl. C10g *1/08*
U.S. Cl. 208—8 7 Claims




A coal/liquid slurry is conducted upwardly in a three-phase fluidized state through a plurality of vessels connected in series, with the gas generated in each individual vessel being purged to a common header by a pressure control system included in each stage for ensuring control of flow through the reactors. The lead vessel includes the following features: a narrow, bottom entrance section designed to produce a superficial liquid velocity which is higher than the minimum fluidization velocity of the heaviest, largest particles in the slurry, so that all entering particles can be fluidized in the entrance section; an expanded upper section designed to slow the upflow of the slurry to a superficial liquid velocity sufficiently lower than the aforesaid minimum fluidization velocity to carry upwardly all particles which are essentially organic in composition but insufficient to carry upwardly a major portion of particles which are essentially nonorganic in nature, so that such major portion of essentially nonorganic particles settle from the upper section and do not carry over to a subsequent vessel; and a side opening at the intersection of these two sections for the continuous withdrawal of a slurry of those particles which settle from the upper section. The vessels subsequent to the leading vessel each have a uniform diameter smaller than the diameter in the lead vessel, so that particles passed from the lead vessel will not settle in the subsequent vessels. Each subsequent vessel also has vertical internals to provide a close approach to plug flow performance. Also, entry ports are provided at the base of each subsequent vessel for hydrogen gas addition.

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3,644,193

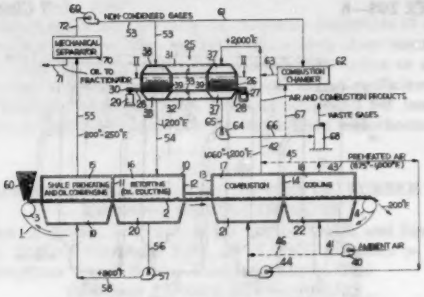
## PROCESS AND APPARATUS FOR THE RECOVERY OF OIL FROM SHALE BY INDIRECT HEATING

Ralph W. Weggel, Wauwatosa, and William A. Blann, Manitowoc, both of Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation of application Ser. No. 686,038, Nov. 28, 1967, now abandoned. This application May 11, 1970, Ser. No. 56,037
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 3 Claims

A system is disclosed for recovering oil from oil-bearing shale rock in which shale is placed on a traveling grate and transported through a preheating zone; a retorting zone where oil is educted from shale; a combustion zone where residual carbon in the shale after the oil is removed, is burned; and a cooling zone. A first gas stream, which may be

air, is passed through shale that has traveled on the grate at least to where combustion takes place. This air is thereby heated, and then used to heat a heat-transfer media such as alumina balls from which a second and oxygen-free gas stream extracts the heat. The second gas stream, heated indirectly by the first gas stream but not contaminated with



combustion gases from the first gas stream, passes through the shale in the retorting zone to educt oil from the shale and then through the shale in the preheating zone where the educted oil is condensed and becomes suspended as a stable mist in the second gas stream from which the oil may be mechanically separated.

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**3,644,194**

## RECOVERY OF OIL FROM TAR SANDS USING WATER-EXTERNAL MICELLAR DISPERSIONS

**Joe T. Keely, deceased, late of Littleton, Colo. (by LaVerne S. Kelly, executrix), and Fred H. Poettman, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio**

**Filed Dec. 29, 1969, Ser. No. 888,899**
**Int. Cl. C10g** *1/04*
**U.S. Cl. 208—11** **15 Claims**

Oil from tar sands is recovered by contacting the tar sands with a water-external micellar dispersion in amounts sufficient to solubilize at least portions of the oil from the tar sands. Thereafter, the solubilized oil within the micellar dispersion is separated from the "spent" tar sands and the oil is recovered from the micellar dispersion. To facilitate the solubilization, the micellar dispersion can have a pH of about 7–14 and the micellar dispersion and/or the tar sand can be heated to temperatures above 100° F. Volume amounts of about 0.05 to about 30 volumes of micellar dispersion per volume of tar sand is useful with the invention. The micellar dispersion contains hydrocarbon, surfactant, aqueous medium, and optionally cosurfactant and/or electrolyte.

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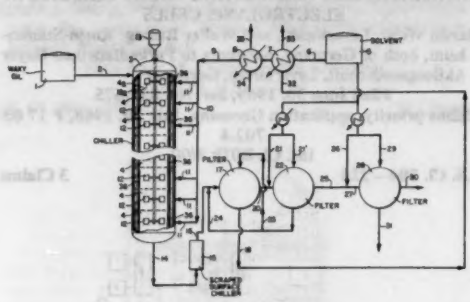
**3,644,195**

## SOLVENT DEWAXING-DEOILING PROCESS

**David A. Gudelis, and John F. Eagen, both of Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company**

**Filed Dec. 1, 1969, Ser. No. 881,025**
**Int. Cl. C10g** *43/08*
**U.S. Cl. 208—33** **16 Claims**

Wax-containing oil is chilled in a multistage tower by the introduction of cold solvent to each stage under intense agitation so that substantially instantaneous mixing and cooling occurs in each stage. The wax is separated from the oil



COMBINED DEWAXING DEOILING PROCESS

and is again mixed with solvent at a temperature sufficient to dissolve the low-melting wax only from which the high-melting wax is then separated.

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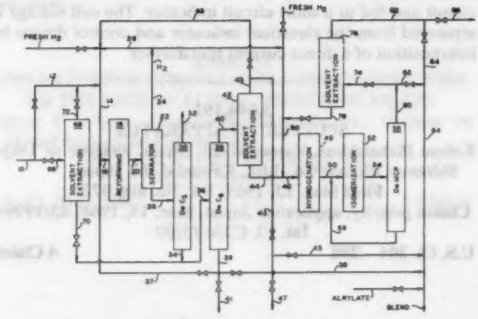
**3,644,196**

## PRODUCTION OF MOTOR FUEL-BLENDING COMPONENTS

**Shelby D. Lawson, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed July 6, 1970, Ser. No. 52,416**
**Int. Cl. C10g** *35/20, 39/00*
**U.S. Cl. 208—62** **14 Claims**



Motor fuel-blending components are produced by a combination of steps comprising naphtha reforming, hydrogenation of aromatics, e.g., benzene, separated from the reformate, and isomerization of cyclohexane to methylcyclopentane.

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**3,644,197**

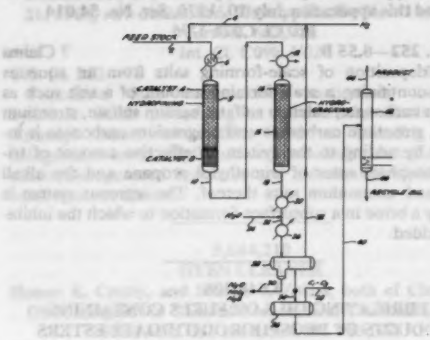
## DUAL-CATALYST HYDROFINING PROCESS

**Arnold E. Kelley, Orange, and Frederick C. Wood, Fullerton, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Filed Jan. 31, 1969, Ser. No. 795,500**
**Int. Cl. C10g** *23/02*
**U.S. Cl. 208—89** **17 Claims**

A hydrofining process to reduce the nitrogen content of mineral oil feedstocks at relatively high-space velocities which comprises contacting the feedstock and added hydrogen with a conventional, substantially nonzeolitic,

amorphous-based hydrofining catalyst, and contacting the effluent therefrom with a second hydrofining catalyst comprising a hydrogenating metal or metal sulfide supported on an active zeolitic cracking base.



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3,644,198

## HYDROGEN-CONSUMING PROCESS AND CATALYST THEREFOR

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 15,960, Mar. 2, 1970. This application May 11, 1970, Ser. No. 36,374

Int. Cl. C10g *23/02*; B01j *11/40*; C10g *23/00*

U.S. Cl. 208—111 13 Claims

A hydrocarbon hydroprocess utilizing a catalytic composite of a porous carrier material, a nickel component, a Group VIII noble metal component and a Group IV-A metal component, in which process there is effected a chemical consumption of hydrogen. A specific example of one such catalyst is a composite of a crystalline aluminosilicate, a nickel component, a platinum component, and a germanium component, particularly for utilization in a hydrocracking process. Other hydrocarbon hydroprocesses are directed toward the hydrogenation of aromatic nuclei, the ring-opening of cyclic hydrocarbons, desulfurization, denitrification, hydrogenation, etc. The catalyst contains 0.01 to about 2.0 percent by weight of the noble metal component, 0.01 to about 5.0 percent by weight of the nickel component, and the atomic ratio of the Group IV-A metal component to the noble metal component is in the range of 0.05:1 to 10.0:1.

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3,644,199

## CONTROL OF CONTACT TIME IN TRANSPORT REACTORS

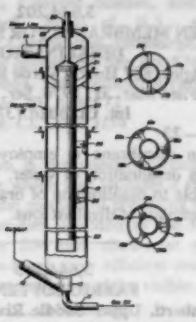
Richard E. Evans, Highland, and Harold D. Zacher, Hammond, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed May 27, 1970, Ser. No. 40,967

Int. Cl. C01b *33/28*; C10g *11/18*, *11/20*

U.S. Cl. 208—120 10 Claims

Conversion of a petroleum stock is effected catalytically in a vertical, elongated transport reactor having an internal elongated open-ended tube closable at its upper end. Passage of the fluid catalyst-oil dispersion through the internal tube is controlled by the degree of closure effected by the positioning of the closure means. Intensity of conversion is regulated by selection of catalyst-oil ratio and control of dispersion velocity in response to the degree of closure.



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3,644,200

## AMMONIATED ZEOLITE CATALYSTS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 23, 1968, Ser. No. 786,437

Int. Cl. B01j *11/40*; C10g *13/02*, *23/00*

U.S. Cl. 208—120 24 Claims

A new class of aluminosilicate zeolite catalysts is described, comprising a crystalline aluminosilicate zeolite modified by the incorporation therein of ammonia in non-zeolitic form. They are prepared by ammoniating the parent aluminosilicate at temperatures above about 350° C., with resultant displacement of water from the zeolite structure ("dehydroammoniation"). The ammonia is believed to be incorporated into the zeolite structure in the form of amide and/or imide groups bonded to silicon and/or aluminum atoms. The resulting compositions are found to display an unique selectivity for catalyzing carbonium ion reactions in hydrocarbon conversions, while competing free radical reactions (leading typically to polymerization and coke formation) are suppressed.

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3,644,201

## EVAPORATION OF WATER DURING UREA ADDUCT FORMATION

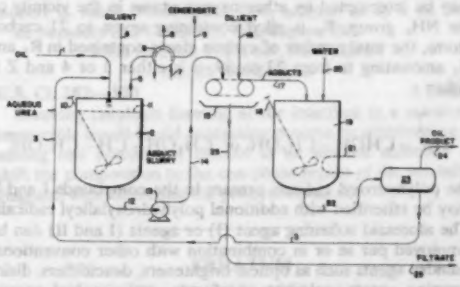
Cornelis W. C. Van Paassen, Hague, and Hubrecht C. A. Van Meurs, Amsterdam, both of Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,791

Claims priority, application Netherlands, Dec. 16, 1968, 6,818,024

Int. Cl. C07b *21/00*

U.S. Cl. 208—308 9 Claims



Extractive crystallization separation process in which adduct formation and concentration of an aqueous solution of

the adduct-forming agent are simultaneously performed in the same reaction zone.

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**3,644,202**

## COLLAGEN MEMBRANES FOR REVERSE OSMOSIS DESALINATION

**Willard S. Higley, 837 Huerte Verde Road, Glendora, Calif.**

**Filed Mar. 31, 1970, Ser. No. 24,337**
**Int. Cl. B01d** *13/00*
**U.S. Cl. 210—23** **5 Claims**

A collagen membrane is employed as reverse osmosis membrane in desalination of water. The process is particularly applicable to desalination of brackish waters containing substantial amounts of divalent ions.

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**3,644,203**

## FABRIC SOFTENER

**Vincent Lamberti, Upper Saddle River, N.J., and Ralph R. Sepulveda, Suffern, N.Y., assignors to Lever Brothers Company, New York, N.Y.**

**Filed Dec. 9, 1968, Ser. No. 782,469**
**Int. Cl. D06m** *13/38*; **C11d** *1/12, 1/86*
**U.S. Cl. 252—8.75** **6 Claims**

An improved fabric softener is disclosed comprising a mixture of a softener such as a quaternary ammonium compound or an imidazoline with an antiyellowing agent which is a complex of $C_{12}$ to $C_{22}$ alkyl alcohol and $C_{12}$ to $C_{19}$ alkylsulfate.

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**3,644,204**

## AGENT FOR THE POST-TREATMENT OF WASHED LAUNDRY

**Arnold Heins, Hilden Rhineland; Hans-Werner Eckert, and Horst Bellinger, both of Dusseldorf, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany**

**Filed July 10, 1968, Ser. No. 743,610**
**Claims priority, application Germany, Aug. 14, 1967, H 63600**
**Int. Cl. D06m** *13/40*
**U.S. Cl. 252—8.8** **8 Claims**

Compositions for the posttreatment of washed laundry, the same being adapted for addition to the rinse water either as a solid or in liquid form comprising a softening agent corresponding to the following formula:

$$R_1-N(Z)-CO-R_2 \quad (I)$$

alone or in combination with a softening agent corresponding to the following formula:

$$R_1-N(CH_2-(CHOH)_n-CH_2OH)-CO-R_2 \quad (II)$$

wherein $R_1$ is alkyl containing 10 to 22 carbon atoms and may be interrupted by ether oxygen atoms in the vicinity of the $NH_2$ group, $R_2$ is alkyl containing seven to 21 carbon atoms, the total number of carbon atoms contained in $R_1$ and $R_2$ amounting to from 23 to 39, $n$ is either 3 or 4 and Z is either

$$H_2C-CHOH-CH_2OH \text{ or } CH_2OH-CH-CH_2OH,$$

the polyhydroxyl radicals present in the compounds I and II may be etherified with additional polyhydroxylalleyl radicals. The aforesaid softening agent (I) or agents (I and II) can be employed per se or in combination with other conventional laundry agents such as optical brighteners, deacidifiers, disincrusting agents, colorants, perfumes, antimicrobial agents, etc.

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**3,644,205**

## INHIBITION OF AQUEOUS SYSTEMS FROM DEPOSITION OF SCALE

**William G. DePierri, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company**

**Original application Apr. 4, 1968, Ser. No. 718,901. Divided and this application July 10, 1970, Ser. No. 54,014**
**Int. Cl. C02b** *5/06*
**U.S. Cl. 252—8.55 B** **7 Claims**

The deposition of scale-forming salts from an aqueous system containing a scale-forming amount of a salt such as calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, strontium carbonate and magnesium carbonate is inhibited by adding to the system an effective amount of triorthophosphate ester of trimethylol propane and the alkali metal and ammonium salts thereof. The aqueous system is suitably a brine in a subsurface formation to which the inhibitor is added.

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**3,644,206**

## LUBRICATING OILS OR FUELS CONTAINING ADDUCTS OF PHOSPHORODITHIOATE ESTERS

**Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation**

**Filed Nov. 14, 1968, Ser. No. 775,916**
**Int. Cl. C10m** *1/48*
**U.S. Cl. 252—46.7** **11 Claims**

Reaction between diorganophosphorodithioate esters and hindered aldehydes, i.e. those having no alpha-hydrogen atoms, produce products having antioxidant and thermal stability characteristics. Such products would be effective in organic base media, such as lubricating oils. The reaction is one of addition rather than condensation.

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**3,644,207**

## LITHIUM-TITANIUM-ZINC FERRITES

**Paul D. Baba, San Carlos, and Giltan Michael Argentina, Belmont, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.**

**Filed Oct. 2, 1969, Ser. No. 863,372**
**Int. Cl. C04b** *35/26*
**U.S. Cl. 252—62.59** **1 Claim**

Microwave ferrites with narrow resonance linewidths, good temperature performance, low losses, low costs, and rectangular hysteresis loops are made from a lithium-titanium ferrite containing a small amount of zinc. In addition, small amounts of copper or manganese can be present in the ferrites.

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**3,644,208**

## LEAK-STOPPING COMPOSITION

**Achim R. Krueger, Cherry Hill, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 748,930, July 31, 1968, now abandoned. This application Dec. 19, 1968, Ser. No. 785,332**
**Int. Cl. C09k** *3/12*
**U.S. Cl. 252—72** **10 Claims**

There is disclosed a liquid composition which is adapted for use as a leak-stopper in heat-exchangers (e.g. automobile radiators) or other vessels designed to hold a liquid; said composition comprises (A) a liquid (e.g. water and/or a suitable alcohol) which is inert to the inside of the vessel and to certain polymeric particles (component B) dispersed therein under the conditions of using the composition, and (B) dispersed in said liquid, substantially spherical particles (within certain size requirements) of a polymeric material which is a solid (nonliquid) under the conditions of using the composition (e.g., a polymeric material containing certain proportions of polyvinyl pyrrolidone (PVP) and polystyrene or a copolymer of styrene and methacrylic acid); preferably at least some of said particles are hollow.

3,644,209

## FUNCTIONAL FLUID COMPOSITIONS

Kurt A. Nowotny, Dublin, Calif., and Robert W. Street, Bloomington, Ind., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 398,080, Sept. 21, 1964, now abandoned. This application Nov. 14, 1967, Ser. No. 682,980

Int. Cl. C09k *3/02*

U.S. Cl. 252—78 5 Claims

Functional fluid compositions particularly useful as hydraulic fluids comprising as base stocks dihalogenated diphenyl ethers or sulfides and as blending agents halogenated lower alkylbenzenes, monohalogenated diphenyl ethers, halogenated benzenes and chlorinated biphenyls or combinations thereof.

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3,644,210

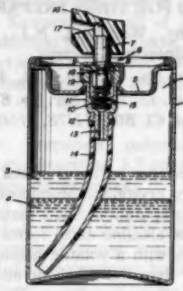
## OVEN CLEANER

Homer E. Crotty, and Michel T. Zalzal, both of Cincinnati, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Mar. 15, 1968, Ser. No. 713,382

Int. Cl. C11d *1/86*

U.S. Cl. 252—548 2 Claims



Burnt food and grease is removed from cooking surfaces by applying an oven cleaning composition comprising from 1.0 to 20 parts alkali metal hydroxide, from 0.4 to 5.0 parts of sodium gluconate, potassium gluconate or glyconic acid, from 0.8 to 10.0 parts of polyethoxylated higher fatty alkanolamides, from 0.8 to 10.0 parts of higher fatty acid sulfonates, from 0.6 to 7.5 parts alkyl benzene sulfonic acid salts, from 0.4 to 5.0 parts disodium N-fatty alkyl B-iminodiproprionate, and from 96.0 to 42.5 parts water; and removing the softened food and grease from the cooking surfaces. The composition can be applied to the cooking surfaces with a brush or from an aerosol spray can containing a halogenated hydrocarbon propellant liquid.

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3,644,211

## DISTYRYLBENZENE-DERIVATIVE SCINTILLATOR SOLUTIONS

Adam Heller, Berkeley, Calif., assignor to New England Nuclear Corporation

Original application June 4, 1963, Ser. No. 285,202, now abandoned. Divided and this application Oct. 30, 1967, Ser. No. 698,999

Claims priority, application Israel, June 27, 1962, 17,560

Int. Cl. C09k *1/02*; G01t *1/20*

U.S. Cl. 252—301.2 3 Claims

Scintillating solutions containing as solute at least one distyrylbenzene derivative compound from the group consisting of P,p'-bis-(3,4-methylene-dioxystyryl)-benzene, 2,2', 3,3'-tetramethoxy-distyrylbenzene, 4,4'-diisopropyl-distyrylbenzene, 2,2'-dimethoxy-distyrylbenzene, 2,2', 5,5'-tetramethyl-distyrylbenzene, 3,3', 4,4'-tetramethyl-distyrylbenzene, readily soluble in organic solvents such as dioxane, xylene and toluene.



3,644,212

## ZINC-MAGNESIUM SILICO-GERMANATE PHOSPHOR COMPOSITION AND METHOD OF PREPARING SAME

William A. McAllister, Convent Station, and Joseph W. Sausville, Glen Rock, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 834,971, June 20, 1969, now abandoned. This application Feb. 18, 1971, Ser. No. 116,572

Int. Cl. C09k *1/54*

U.S. Cl. 252—301.6 F 6 Claims

Phosphor composition is manganese-activated zinc-magnesium silico-germanate which also includes a small addition of arsenic and lead. In the method of preparing the phosphor composition, the magnesium is added as the fluoride. The phosphor is excited by 254 nm. ultraviolet radiations to fluoresce with a narrow-band, very efficient emission which is concentrated in the green region of the visible spectrum.

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3,644,213

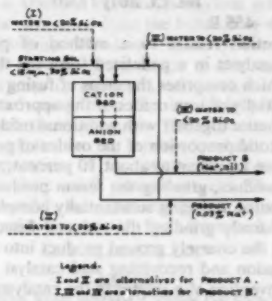
## STABILIZING AQUEOUS DEIONIZED SILICA SOLS OF SMALL PARTICLE SIZE AGAINST CELLING

Peter H. Vossos, Berwyn, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Dec. 4, 1968, Ser. No. 781,205

Int. Cl. B01j *13/00*; C01b *33/14*

U.S. Cl. 252—313 S 1 Claim




A starting aqueous silica sol of greater than 20 percent solids content and of no more than about 8 millimicrons average particle size is stabilized by deionization, and by adding deionized water to the resulting sol before the lapse of about 48 hours following deionization until the solids concentration is reduced to about 15 percent.

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3,644,214

## EMULSION BREAKING

Robert B. Akell, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1969, Ser. No. 872,181

Int. Cl. B01d *17/00*

U.S. Cl. 252—320 3 Claims

Breaking emulsion forming at the interface in a relatively immiscible liquid-liquid contacting process by withdrawing it, adding one component thereof in an amount sufficient to shift the composition to the one-phase region of the solubility diagram, then collecting the product obtained.

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## ERRATUM

For Class 252—364 see:
Patent No. 3,644,433

3,644,215

## PROCESS FOR CONVERTING LIQUID ANTIOXIDANTS TO PULVERULENT FORM

Karl-Hans Muller, Grossauheim, Germany, assignor to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Dec. 2, 1969, Ser. No. 881,612
Claims priority, application Germany, Dec. 3, 1968, P 18 12 352.9
Int. Cl. A23k *3/00*; B01j *1/16*
U.S. Cl. 252—404 6 Claims

Liquid antioxidants such as are used in milk replacers and mixed feed compositions are converted to pulverulent form by placing an active, highly dispersed, synthetic silica into a mixing vessel and then spraying or pouring the antioxidant upon the silica while subjecting the mass to a mixing operation.

A homogeneous mixture between the liquid additive and the solid components can thus be obtained even in those cases where the liquid is used only in small amounts.

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3,644,216

## CATALYSTS

Roger Egalon, and Ramiro Tella, both of Saint Andre, Nord, France, assignors to Societe Anonyme: Ugine Kuhlmann, Paris, France

Continuation-in-part of application Ser. No. 705,862, Feb. 15, 1968, now abandoned, Continuation-in-part of application Ser. No. 386,481, July 22, 1964, now abandoned. This application Aug. 19, 1969, Ser. No. 851,434
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R 7 Claims

This invention relates to a method of preparing iron-promoted catalysts in a pelletized form for the synthesis of ammonia which comprises the steps of fusing a mixture consisting essentially of iron oxides of the approximate composition of magnetite together with additional oxides of promoter metals in a total proportion of the oxides of promoter metals of from about 1 percent to about 10 percent, rapidly cooling the fusion product, grinding the fusion product to give fine, regular granules, reducing substantially completely the fused granules, coarsely grinding the reduced fused granules, agglomerating the coarsely ground product into pellets by simple compression and recovering said catalyst in a pelletized form. The invention also relates to the catalysts so produced.

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3,644,217

## SYNERGISTIC MIXTURE AND USE THEREOF

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 2, 1968, Ser. No. 780,584
Int. Cl. C08c *13/08*; C08d *11/04*; C08f *45/58*
U.S. Cl. 252—400 9 Claims

Synergistic mixture of a boron compound devoid of nitrogen and at least one of a hydroxyphenone, an N-hydroxyphenylbenzotriazole and a salicylic acid ester. The mixture is used as an additive to stabilize plastic, resins and fibers against deterioration due to weathering, oxidation, heat, etc.

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3,644,218

## CATALYSTS FOR OLEFIN DIMERIZATION

Howard E. Dunn, Evansville, Ind., assignor to Phillips Petroleum Company

Original application May 5, 1969, Ser. No. 822,053, now Patent No. 3,558,738. Divided and this application July 24, 1970, Ser. No. 58,177
Int. Cl. C07c *3/10*
U.S. Cl. 252—431 C 9 Claims

A catalyst for olefin dimerization is formed from an organoaluminum compound and one of the following nickel complexes:

a. a N,N-dihydrocarbyldithiocarbamato nickel complex;
b. a bis(pyridinecarboxylato)nickel complex;
c. a thiobisphenol nickel complex;
d. thiobisphenol nickel amine complex; or
e. an amine-N-oxide nickel complex.

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3,644,219

## PREPARATION OF A CRYSTALLINE ALUMINOSILICATE-ALUMINA CATALYST COMPOSITION

Roy T. Mitsche, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 760,691, Sept. 18, 1968, now Patent No. 3,562,345. This application Feb. 11, 1970, Ser. No. 10,637
Int. Cl. B01j *11/78*, *11/40*
U.S. Cl. 252—442 5 Claims

A method of preparing a catalyst composition comprising as essential components thereof, a crystalline aluminosilicate with a mordenite crystal structure containing alumina fixed in combination therewith. The catalyst composition is aged in an alkaline media to yield a catalyst substantially improved in activity, particularly with respect to the transalkylation of alkylaromatic hydrocarbons.

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3,644,220

## METAL HALIDE CONTAINING ZEOLITES AND METHOD FOR THEIR PREPARATION

Kenneth K. Kearby, Watchung, N.J., assignor to Esso Research and Engineering Company

Continuation of Ser. No. 672,690, Oct. 4, 1967 abandoned
Filed Nov. 13, 1969, Ser. No. 871,627
Int. Cl. B01j *11/78*, *11/40*
U.S. Cl. 252—442 24 Claims

This disclosure relates to novel metal halide containing zeolites, particularly crystalline aluminosilicate zeolites and methods for their preparation. Such materials are prepared by treating alkali or alkaline earth forms of crystalline aluminosilicate zeolites with a volatile halide of a less positive metal or nonmetal than the alkali or alkaline earth metals under relatively anhydrous conditions. The resulting products may be used as formed or may be washed free of soluble halides prior to use. Utility for these materials is to be found as adsorbents, particularly selective adsorbents and as catalysts for acid-catalyzed reactions such as catalytic cracking, alkylation, polymerization, isomerization and other carbonium ion type reactions.

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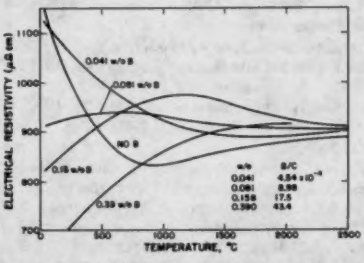
3,644,221

## POLYCRYSTALLINE GRAPHITE WITH CONTROLLED ELECTRICAL CONDUCTIVITY

Paul Wagner; James M. Dickinson, and Morton C. Smith, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 14, 1969, Ser. No. 876,931
Int. Cl. H01b *1/04*
U.S. Cl. 252—503 1 Claim




An electrical resistance element which comprises polycrystalline graphite containing 0.08 weight percent of

boron and which has an electrical resistivity that is constant within a 5 percent band over the temperature range 0°–2500° C.

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**ERRATUM**

For Class 252—522 see:
Patent No. 3,644,505

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**3,644,222**
**ABLATIVE EPOXY RESIN COMPOSITION AND METHOD OF PREPARATION**

**Gerald J. Fleming, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Oct. 31, 1967, Ser. No. 679,560**
**Int. Cl. C08g** *30/12*
**U.S. Cl. 260—2 EA** **8 Claims**

A method of decreasing the erosion rate and thermal conductivity of epoxy resins by the addition of bridged Diels-Alder anhydride adducts and the resulting ablative compositions.

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**3,644,223**
**PROCESS OF PREPARING POLYEPOXIDES**

**Koji Hashimoto; Noboru Mogi, both of Yokohama-shi, and Makoto Shindo, Kawasaki-shi, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of application Ser. No. 527,083, Feb. 14, 1966. This application Aug. 13, 1969, Ser. No. 849,860**
**Int. Cl. C08f** *7/12*
**U.S. Cl. 260—2** **6 Claims**

A process for preparing polyepoxides comprising polymerizing or copolymerizing 1,2-epoxides, using as the catalyst a composition composed of:

a. A metal salt of a carboxylic acid, e.g., lead, chromium, manganese, cobalt, nickel or iron salt;
b. at least one organoaluminum compound, e.g., trialkylaluminum and dialkylaluminum halides; and optionally
c. at least one ether;

said catalyst composition being prepared by mixing (a), (b) and (c) and thereafter holding the mixture at a temperature higher than that at which the 1,2-epoxides are to be polymerized, for a period ranging from 1 minute to a few hours.

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**3,644,224**
**PROCESS FOR POLYMERIZING EPOXIDES**

**Hiroshi Hani, and Yasushi Masuda, both of Kanagawa-ken, Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan**

**Filed Sept. 25, 1969, Ser. No. 862,162**
**Claims priority, application Japan, Oct. 4, 1968, 43/71840**
**Int. Cl. C08g** *23/06, 23/14*
**U.S. Cl. 260—2 A** **12 Claims**

In the polymerization of an epoxide, a high conversion of the monomer to the polymer and a high yield of solid polymer are attained by use of a new catalyst which is formed by reacting an imide with the reaction product of a hydrocarbon-aluminum compound with an ether. The amount of the catalyst required is small in comparison with the conventional processes.

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**3,644,225**
**ION-EXCHANGE COPOLYMERS AND MEMBRANES MADE THEREOF**

**Jean Pierre Quentin, Lyon, and Michel Ruaud, Villeneuve-Par-Ternay Rhone, both of France, assignors to Rhone-Poulenc S.A., Paris, France**

**Filed Sept. 25, 1969, Ser. No. 861,187**
**Claims priority, application France, Sept. 27, 1968, 167,943**
**Int. Cl. C08f** *19/00*
**U.S. Cl. 260—2.1 E** **22 Claims**

Ungrafted copolymers of vinyl alcohol units and vinyl monomer units containing tertiary amino groups cross-linked by reaction with a polyquaternization agent are useful for making anion-exchange membranes.

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**3,644,226**
**ANION-EXCHANGE COPOLYMERS**

**Henri Chabert, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France**

**Filed Sept. 29, 1969, Ser. No. 861,991**
**Claims priority, application France, Oct. 1, 1968, 168323**
**Int. Cl. C08f** *19/08*
**U.S. Cl. 260—2.1 E** **2 Claims**

Crystalline, sequence-type, propylene-styrene copolymers containing quaternary ammonium residues are useful for making anion-exchange membranes.

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**3,644,227**
**SEPARATION OF POLY(2,6-DIMETHYL-1,4-PHENYLENE OXIDE) FROM ITS BLENDS WITH OTHER POLYMERS**

**Arnold Factor, Scotia, N.Y., assignor to General Electric Company**

**Filed July 7, 1969, Ser. No. 839,690**
**Int. Cl. C08g** *53/22*
**U.S. Cl. 260—2.3** **6 Claims**

Poly(2,6-dimethyl-1,4-phenylene oxide) can be separated from a blend of this polymer with any other polymer which is soluble in dichloromethane, dibromomethane or bromochloromethane. Initially, the entire blend is soluble in these solvents, but on standing the polyphenylene oxide precipitates and can be separated from the balance of the solution. Exposing the polymer blend to vapors of these solvents, also causes the polyphenylene oxide to become insoluble, so that the polymer or polymers with which it is blended can be extracted away from the insoluble polyphenylene oxide by use of these solvents. The separated, insoluble polyphenylene oxide can be rendered soluble by vacuum treatment, evaporation of the contained solvent, washing with a polyphenylene oxide nonsolvent, etc. Therefore, this technique is useful for recovering or separating this polyphenylene oxide in a useable form from such blends.

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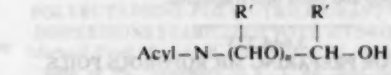
**3,644,228**
**PROCESS FOR THE PRODUCTION OF SYNTHETIC RESINS WHICH CONTAIN URETHANE GROUPS**

**Hans Joachim Diehr; Rudolf Merten, and Konrad Uhlig, all of Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**Filed Jan. 19, 1970, Ser. No. 4,028**
**Claims priority, application Germany, Jan. 29, 1969, P 19 04 232.1**
**Int. Cl. C08c** *17/08*
**U.S. Cl. 260—2.5 AJ** **7 Claims**

A process is provided for the production of synthetic urethane resins from polyhydroxyl compounds, polyisocyanates organic, flame protective agents and, if desired; blowing agents and other additives in which N-methylol compounds of the structure



are employed wherein the Acyl radical represents a $-COH$, $-COR''$, $-COOR''$, $-SO_2R''$, $-SO_2R'''$ or $-PO(OR'')_2$ radical in which $R''$ is a $C_1$ to $C_{18}$ alkyl radical and $R'''$ is a $C_6$ to $C_{14}$, preferably $C_6$, aryl radical, R and R' are hydrogen or a $C_1$ to $C_4$ alkyl radical and $n$ is an integer of 1 to 3 are used in a quantity of from about 1 to about 20 percent by weight based on the quantity of polyisocyanate.

3,644,229

## HYDROPHILIC-POROMERIC FOAM METHOD OF MAKING, AND ARTICLES MADE THEREFROM

Eugene B. Butler, Kent; Ivan A. Fak, Munroe Falls, and Lawrene L. Line, Kent, all of Ohio, assignors to The General Tire & Rubber Company

Filed June 1, 1970, Ser. No. 42,592
Int. Cl. C08f 47/10; C08g 22/44
U.S. Cl. 260—2.5 AD 15 Claims

This invention relates to a hydrophilic and poromeric foam made from a blend of plastisol grade vinyl chloride resin, at least one compatible liquid plasticizer, a stabilizer for said vinyl chloride resin, a polyurethane precursor and a mixture of specific emulsifiers.

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3,644,230

## EXTRUSION PROCESS FOR POLYOLEFIN FOAM

Edward W. Cronin, Wilmington, Del., assignor to Haskon, Inc., New Castle, Del.

Filed Feb. 19, 1968, Ser. No. 706,661
Int. Cl. C08f 47/10, 3/04; B29d 27/00
U.S. Cl. 260—2.5 E 4 Claims

Post extrusion cell collapse in polyolefin foams is prevented by the incorporation of a small amount of a partial ester of a long chain fatty acid and a polyol.

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3,644,231

## POROUS MEMBER FOR DIFFUSING AIR AND PROCESS FOR PRODUCING THE SAME

Mitsuru Maruya, Tokyo; Yoshio Oono; Bunji Fukuda, both of Ichikawa, and Kenji Takahashi, Tokyo, all of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1968, Ser. No. 709,775
Int. Cl. C08j 1/16, 1/18
U.S. Cl. 260—2.5 F 10 Claims

The invention relates to a method of foaming a solution of a polyvinyl acetal resin containing a foaming agent and thereafter impregnating said foam with a precondensate or monomer of curable resin. The final product is used as a member for diffusing gas.

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3,644,232

## FLAME-RESISTANT, NONBURSTING POLYISOCYANURATE FOAMS

David L. Bernard, Pittsburgh; John K. Backus, Allison Park, and William C. Darr, Bridgeville, all of Pa., assignors to Mobay Chemical Company, Pittsburgh, Pa.

Filed May 24, 1968, Ser. No. 731,705
Int. Cl. C08g 22/18, 22/46
U.S. Cl. 260—2.5 AW 4 Claims

Polyisocyanurate foams are prepared by reacting an organic polyisocyanurate mixture of polyphenyl polymethylene polyisocyanates wherein from about 10 to about 70 percent of the total methylene groups are ortho to at least one NCO group and from about 2 percent to about 20 percent of the total methylene groups are ortho to two NCO groups on adjacent aromatic rings. The polyisocyanurate foam is prepared from this mixture of isocyanates in the presence of a trimerization catalyst and an inert blowing agent and preferably a foam stabilizer. These foams when subjected to a flame do not pop and burst into fragments.

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3,644,233

## PROCESS FOR PREPARING MICROPOROUS FOILS FROM POLYURETHANES CONTAINING HYDRATED ELECTROLYTES

Harro Traubel, and Harald Oertel, both of Farbenfabriken Bayer A.G., Leverkusen Bayerwerk, Germany

Filed July 18, 1968, Ser. No. 745,687
Claims priority, application Germany, Aug. 9, 1967, F 53187
Int. Cl. C08b 22/44, 53/08; C09d 5/00
U.S. Cl. 260—2.5 AY 3 Claims

Microporous sheet structures having increased permeability to water vapor are prepared by coagulating a solution of a polyurethane by washing out the solvent of the solution with a nonsolvent, the coagulation being conducted in the presence of an electrolyte.

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3,644,234

## METHOD OF PREPARING CELLULAR POLYMERS FROM ORGANIC POLYISOCYANATES AND POLYCARBOXYLIC ACID COMPOUNDS

Robin L. Grieve, North Guilford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 27, 1969, Ser. No. 794,367
Int. Cl. C08q 22/44
U.S. Cl. 260—2.5 13 Claims

High-temperature resistant cellular polymers are prepared in a one-shot procedure by reacting a polycarboxylic acid or polycarboxylic anhydride with an organic polyisocyanate in the presence of a catalytic amount of a monomeric homocyclic polyepoxide and a tertiary amine. The use of the latter catalyst system permits foam formation to proceed without the need to supply external heat to the reaction mixture after the reactants are brought together. This permits pouring in place of the foam-forming system, for example, in the insulation of cavity walls for construction purposes, in trailer walls, and in cold storage frameworks and the like.

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3,644,235

## POLYURETHANE FOAMS

Michael Alexander Howat Gray, Harlington, England, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 20, 1969, Ser. No. 801,148
Claims priority, application Great Britain, Feb. 22, 1968, 8,725/68
Int. Cl. C08g 22/44, 53/10
U.S. Cl. 260—2.5 AM 9 Claims

In processes for producing flexible polyurethane foams having sag factors higher than 2.5, which processes include the step of reaction of a polyisocyanate with a polymeric polyol, the improvement of using as the polyisocyanate an undistilled primary diamine phosgenation product having an amine equivalent of from 87 to 168, and conducting the reaction in the presence of a catalyst, a blowing agent, and a chain extender consisting of a primary amine.

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3,644,236

## LEAD FILLED POLYURETHANE FOAMS

James Macoustra, Sutton, Surrey, England, assignor to BP Chemicals (U.K.) Limited, London, England

Filed Feb. 20, 1969, Ser. No. 801,159
Claims priority, application Great Britain, Feb. 21, 1968, 8,377/68
Int. Cl. C08g 22/44; B32b 27/20; E04b 1/74
U.S. Cl. 260—2.5 5 Claims

Lead filled polyurethane foams having a Young's Modulus value above 30,000.

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3,644,237

## POLYURETHANE FOAM MATERIALS

Raymond V. Crawford, Liverpool, and Gavin E. Roscoe, Formby, both of England, assignors to Bibby Chemicals Limited, Liverpool, England

Filed Feb. 26, 1969, Ser. No. 802,656
Claims priority, application Great Britain, Mar. 8, 1968, 11,324/68
Int. Cl. C08g 22/44, 53/10
U.S. Cl. 260—2.5 AM 7 Claims

The invention is concerned with the production of polyurethane foams of the kind formed by reaction between a polyisocyanate (which term includes a di-isocyanate) and a glycol ester of a tribasic adduct obtained by reaction between a reactive dienophile e.g. maleic anhydride and an unsaturated fatty acid or ester. The process of the invention is directed to the production of polyurethane foams of that

kind which are of finer cell structure and are less friable than previous foams of this kind by a more economic method which also avoids the distillation of unreacted acids from the tribasic adduct reaction product.

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3,644,238

## CELLULAR MATERIAL INHIBITED FROM FOULING WITH MICRO-ORGANISM GROWTH

Richard L. Smith, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed May 22, 1969, Ser. No. 827,019The portion of the term of the patent subsequent to May 27, 1986, has been disclaimed.

Int. Cl. C08g *22/04*

U.S. Cl. 260—2.5 AK 4 Claims

A method and apparatus for inhibiting or preventing fouling of open-cell reticulate foams which are made of a material such as polyurethane or the like and which are used as inserts in aircraft fuel tanks. The micro-organisms present in turbine aircraft fuel such as kerosene can produce a gellike contaminant which rapidly forms in the cellular structure of open-cell foams and can completely fill or clog such structure, thus diminishing the fuel-carrying capacity of the tank and adding unwanted weight to the aircraft. The formation and adhesion of micro-organism growth in open-cell foams is eliminated or materially reduced by providing a foam incorporating a systemic toxin such as an acid addition salt of rosaniline. Dyes generally known as "Brilliant green" or "Malachite green" are suitable for use as such systemic toxins.

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3,644,239

## RETICULATED NYLON STRUCTURES

Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Original application May 29, 1967, Ser. No. 641,769, now Patent No. 3,496,266, dated Feb. 17, 1970. Divided and this application July 17, 1969, Ser. No. 842,663

Int. Cl. B29d *27/00*; B29h *7/20*; B29c *25/00*

U.S. Cl. 260—2.5 2 Claims

A reticulated nylon structure formed of strands integrally interconnected by thickened strand junctures at spaced-apart points so as to form the skeletal structure of a multitude of polyhedrons whose faces are polygonal, are common to a polyhedron adjacent thereto, and are open and substantially free of membranes, with such structure being suitable, for example, as a filter.

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3,644,240

## ROOF INSULATION ADHESIVE

Harlan E. Tarbell, Torrance; Donald W. Mogg, Redondo Beach, both of Calif., and Frederick L. Shea, Johnson City, Tenn., assignors to Grefco, Inc., Philadelphia, Pa.

Continuation-in-part of application Ser. No. 493,218, Oct. 5, 1965, now abandoned. This application Oct. 14, 1968, Ser. No. 767,478

Int. Cl. C08d *9/12*; C08f *45/52*

U.S. Cl. 260—4 R 8 Claims

Excellent adhesives are prepared with: asphalt, about 40 parts by weight; an unsaturated rubber such as devulcanized tire rubber, 1 to 18 percent; a saturated rubber such as butyl rubber, 0.7 to 3 percent; a water-immiscible asphalt solvent, 20 to 41 parts; and water 5 to 20 parts. The devulcanized rubber, when used, may have been rendered more compatible with asphalt by having been previously compounded with about half its weight of polyethylene.

3,644,241

## ANTISOILING AEROSOL STARCH PREPARED FROM ETHOXYLATED STARCH AND A FLUOROACRYLATE OR FLUOROALPHA SUBSTITUTED ACRYLATE POLYMER

Pasquale Joseph Falivene, Union City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 11, 1970, Ser. No. 18,764

Int. Cl. C08f *45/58*

U.S. Cl. 260—17.4 ST 8 Claims

Aerosol spray starch compositions containing fluoropolymer emulsion in alkaline aqueous medium stabilized by ethoxylated starch.

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3,644,242

## DIALLYL CARBONATE FILLED COMPOSITIONS

David A. Berry, Columbus, and Gilbert M. Gynn, Hilliard, both of Ohio, assignors to Dart Industries Inc.

Filed Apr. 16, 1969, Ser. No. 816,794

Int. Cl. C08f *45/04*, *45/18*

U.S. Cl. 260—17.4 CL 6 Claims

Compositions comprising diallyl carbonate polymers and at least a primary filler such as alpha cellulose, glass fibers, polyester fibers, and mixtures thereof have better stain resistance and better impact resistance and other strength properties than prior art compositions recognized as outstanding for use in dinnerware. The compositions can also contain such secondary fillers as clay, calcium carbonate, magnesium carbonate, silica powder and the like. They also have excellent hardness and resistance to chemical attack by alkali and detergents and have excellent high-temperature properties.

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3,644,243

## THIASPIROACETAL POLYMERS

Frank V. Zalar, South Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed July 3, 1968, Ser. No. 742,179

Int. Cl. C08g *23/00*

U.S. Cl. 260—18 R 10 Claims

Polymers with high tensile and flexural strength, suitable for molding or milling, are obtained by the reaction of pentaerythritol with a thiadialdehyde or derivative thereof, or by the reaction of a reactive metal sulfide with a 3,9-bis(halomethyl)-spirobi(meta-dioxane) or a similar spiro intermediate. "Copolymers" may be prepared by substituting a salt of a dithiol for the sulfide.

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## ERRATUM

For Class 260—22 see:
Patent No. 3,644,612

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3,644,244

## POLYBUTADIENE-POLYNITRILE GRAFT COPOLYMER DISPERSIONS STABILIZED WITH HYDROXYLAMINES

Michael Fryd, Broomall, and Walter W. Kaminski, Chester, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1969, Ser. No. 791,497

Int. Cl. C08g *51/60*

U.S. Cl. 260—23 R 28 Claims

Organosols of polybutadiene-polynitrile graft copolymers, stabilized against gelation by hydroxylamines. These compositions are useful as can coatings.

3,644,245

## HOT MELT ADHESIVES CONTAINING SILANE COMPOUNDS

Thomas P. Flanagan, Green Brook, and Irving Kaye, Murray Hill, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,642
Int. Cl. C08f 21/04
U.S. Cl. 260—23 5 Claims

Hot melt adhesive compositions characterized by their improved adhesion under conditions of high humidity or moisture; said adhesives comprising a blend of a synthetic polymer base and a specified silane compound.

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3,644,246

## LUBRICATING STABILIZERS FOR CHLORINE-CONTAINING POLYMERS

Merrill Lozanou, East Lyme, Conn., assignor to Chas. Pfizer & Co., Inc., New York, N.Y.

Filed Dec. 11, 1969, Ser. No. 884,377
Int. Cl. C08f 45/62
U.S. Cl. 260—23 XA 5 Claims

Lubricating heat and light stabilizer compositions for chlorine-containing polymers comprising a mixture of an organotin carboxylate and a metal salt of a monoalkyl ester of an unsaturated dicarboxylic acid, and plastic compositions prepared therefrom.

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3,644,247

## ENCAPSULATING ELASTOMERIC COMPOUND

Robert G. Grunther, Crofton; Clarence K. Chatten, Annapolis, and Alexander Lebovits, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 731,278, May 22, 1968, now abandoned. This application Aug. 17, 1970, Ser. No. 64,664
Int. Cl. C08d 11/00
U.S. Cl. 260—23.7 H 3 Claims

An encapsulating compound for deep submergence use is a butyl and chlorobutyl copolymer containing reactive chlorine and having added thereto specific fillers, activators, accelerators and curing agents. The resulting compound is useful in encapsulating components exposed to deep sea environments. One such specific compound includes the following constituents:

| | |
|---|---|
| Parts per 100 by weight of | an elastomeric isobutylene-isoprene copolymer containing reactive chlorine |
| 50 | filler |
| 10 | lead monoxide |
| 1 | flaked stearic acid |
| 3 | polyethylene plasticizer |
| 2/1.5 | diphenylguanidine and 2-mercaptoimidazoline accelerators |
| 1 | magnesium oxide activator and |
| 5 | zinc oxide curing agent. |


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3,644,248

## PROCESS FOR PREPARING A NOVEL THERMOPLASTIC RUBBER AND NOVEL THERMOPLASTIC RUBBER COMPOSITION

Pieter Luijk; Evert Van Gelderen, and Gervinus P. Schipper, all of Delft, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed June 13, 1969, Ser. No. 833,154
Claims priority, application Great Britain, July 4, 1968, 31,986/68
Int. Cl. C08f 27/00
U.S. Cl. 260—23.7 M 9 Claims

A polyisoprene rubber derivative having the properties of a thermoplastic elastomer is prepared by reaction of polyisoprene with maleic anhydride and subsequent reaction with a fatty acid salt of a Group II or IV metal such as zinc stearate.

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3,644,249

## POLYVINYL CHLORIDE RESIN COMPOSITION HAVING EXCELLENT TRANSPARENCY, SURFACE GLOSS AND IMPACT STRENGTH

Fumio Ide; Kenji Okano, and Seiji Deguchi, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd. and Nitto Chemical, Tokyo, Japan

Filed July 8, 1969, Ser. No. 839,946
Claims priority, application Japan, July 10, 1968, 43/48360; July 12, 1968, 43/48854
U.S. Cl. 260—23.7 R 4 Claims

PVC resin compositions of improved transparency, surface gloss and impact resistance are obtained by mixing the PVC with a graft polymer. The graft is produced by grafting first methyl methacrylate and then styrene onto an elastomer of butadiene, n-butyl acrylate, and styrene in the proportions shown in the accompanying ternary constitutional diagram. When the monomer(s) used in preparing the aforesaid graft polymer have a small quantity of $C_{10}$ to $C_{18}$ saturated fatty acid dissolved therein, the PVC compositions prepared from the graft polymer show further improvements in their properties.

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3,644,250

## POLYVINYL CHLORIDE RESIN COMPOSITION HAVING EXCELLENT TRANSPARENCY AND IMPACT STRENGTH

Fumio Ide; Kenji Okano, and Seiji Deguchi, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd. and Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed July 9, 1969, Ser. No. 840,240
Claims priority, application Japan, July 10, 1968, 43/48360; July 12, 1968, 43/48854
U.S. Cl. 260—23.7 R 4 Claims

PVC resin compositions of improved transparency and impact are obtained by mixing the PVC with a graft polymer. The graft is produced by grafting first styrene and then methyl methacrylate onto an elastomer of butadiene, n-butyl acrylate, and styrene in the proportions shown in the accompanying ternary constitutional diagram. When the monomer(s) used in preparing the aforesaid graft polymer have a small quantity of $C_{10}$ to $C_{18}$ saturated fatty acid dissolved therein, the PVC compositions prepared from the graft polymer show further improvements in their properties.

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3,644,251

## NONWOVEN FABRICS AND BINDERS THEREFOR

Werner Alfred Wilhelmi, Bussum, Netherlands, assignor to Nederlandsche Bewoid Maatschappij N.V.

Filed Apr. 8, 1969, Ser. No. 814,456
Int. Cl. C08d 9/12; C08g 17/16; D06n 3/04
U.S. Cl. 260—26 14 Claims

Nonwoven fabrics that have excellent wet strength and dry strength are formed by adding to an aqueous suspension of natural and/or synthetic fibers a binder comprising (a) an anionic polymer latex and (b) a mixture of alkali metal salts of disproportionated rosin and fortified rosin, precipitating the binder on the fibers, and forming the treated fibers into a nonwoven fabric.

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3,644,252

## ADHESIVE COMPOSITIONS CONTAINING STYRENE/ISOBUTYLENE COPOLYMER

Richard S. Shenfeld; Frederick M. Musser, and Girish U. Kothari, all of Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 13, 1969, Ser. No. 824,317
Int. Cl. C08f 41/12
U.S. Cl. 260—27 R 7 Claims

This invention discloses a new hot-melt, pressure-sensitive

adhesive composition comprising a primary polymer consisting of a solid, homogeneous and essentially random copolymer of styrene and isobutylene having a number average molecular weight of from about 1,000 to about 4,000, a heterogeneity index of from about 1.50 to about 2.25 and a styrene content of from about 40 to about 90 weight percent, and a secondary polymer selected from the group consisting of a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and an alkyl acrylate, a polyvinyl-alkyl ether, a terpolymer of ethylene, vinyl acetate and acrylic acid, and a terpolymer of ethylene, vinyl acetate and methacrylic acid.

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3,644,253

## AQUEOUS EMULSIONS

Armin Hiestand, Binningen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

Filed Apr. 1, 1970, Ser. No. 24,870
Claims priority, application Switzerland, Apr. 9, 1969, 5451/69
Int. Cl. C08g 51/52
U.S. Cl. 260—28 8 Claims

Aqueous emulsions are provided, which are used for the preparation of baths serving to produce wash-fast water-repellent finishes on fiber materials. These emulsions contain relative to the dry weight of the components (a) 9 to 54 percent of a methylolaminotriazone etherified with higher fatty alcohols, (b) 4.5 to 48 percent of a waxy substance and (c) 40 to 55 percent of a reaction product of an aminoplast precondensate, a monohydroxy compound, a polyethylene glycol and an oxygen-containing aliphatic or heterocyclic amine. The solids content of these emulsions is 10 to 50 percent by weight. For use these emulsions are diluted with water, and a curing catalyst is added.

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3,644,254

## COATING COMPOSITIONS

Jimmy S. Dew, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed May 21, 1968, Ser. No. 730,928
Int. Cl. C08f 45/52
U.S. Cl. 260—28.5 AV 4 Claims

Heat-sealable compositions containing ethylene-vinyl acetate copolymers, petroleum wax, and at least one polyethylene resin, and a process for their preparation.

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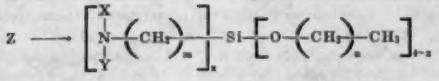
3,644,255

## STABLE DISPERSIONS

Darrell R. Thompson, Charlotte, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 776,774, Nov. 18, 1968. This application Dec. 9, 1969, Ser. No. 883,648
Int. Cl. B01f 17/54; C08f 45/26, 45/32
U.S. Cl. 260—29.1 R 37 Claims

A dispersion of particles in an organic liquid containing, as an antiflocculating agent, molecules of a polymeric material represented by the structure



where

Z can be a polymeric segment bearing functional groups capable of bonding to the nitrogen atom, and

X and Y can be any substituent which does not interfere with bonding to the nitrogen atom.

3,644,256

## RESORCINOL-FORMALDEHYDE-LATEX ADHESIVE CONTAINING TRIALLYL CYANURATE WITH HIGH-RINGBOUND CHLORINE CONTENT

Raymond Broisman, Linden, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 8, 1969, Ser. No. 848,690
Int. Cl. C08g 5/10
U.S. Cl. 260—29.3 4 Claims

A. 50–95 parts of a resorcinol-formaldehyde-latex adhesive composition,

B. 5–50 parts of an aqueous dispersion of 10–70 percent of the reaction product of

1. a composition derived by reacting a triallyl cyanurate composition having 0.05 to 3.0 percent ring-bound chlorine, with 6–10 moles or resorcinol per mole of cyanurate; and
2. 0.2 to 0.6 mole of formaldehyde per mole of resorcinol in (1)

These compositions are useful in bonding rubber to reinforcing fibers.

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3,644,257

## ACID CURABLE VINYLACETATE COPOLYMER LATEX-POLYVINYL ALCOHOL ADHESIVE

Richard Gorham Nickerson, Harvard; Barry Russell Harris, Concord, and Morris Breslouf, South Acton, all of Mass., assignors to Borden Inc., New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,407
Int. Cl. C08f 15/36, 37/14, 37/18
U.S. Cl. 260—29.6 WB 10 Claims

This invention relates to corrugating adhesives comprising a polyvinyl alcohol and an aqueous emulsion copolymer of vinyl acetate with a minor amount of a coreactive olefinically unsaturated carboxylated monomer; to a process of manufacturing corrugated paperboard having improved water resistance, said process comprising the steps of applying said adhesives between at least one nonfluted liner and one fluted medium and curing the adhesive while it is at a pH below 6; and to the resultant corrugated paperboard.

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3,644,258

## METHOD OF PREPARING HIGH-SOLIDS LATEXES OF OLEFIN POLYMERS

Carl Moore, Midland; James B. Louch, Coleman, both of Mich., and Russell L. Stainfield, Williamsburg, Va., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1969, Ser. No. 808,690
Int. Cl. C08f 3/42
U.S. Cl. 260—29.6 H 10 Claims

Fluid, high-solids latexes of normally solid, water and alkali insoluble thermoplastic organic addition polymers containing a plurality of acid groups in the polymer structure are prepared by (1) heating a low-solids aqueous emulsion of the polymer, e.g., ethylene/acrylic acid copolymer, at the softening point of the polymer while simultaneously lowering the pH of the emulsion to a value between about 6.0 and about 8.3 and (2) concentrating the emulsion.

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3,644,259

## METHOD FOR MAKING BREATHABLE POLYVINYL CHLORIDE FILM

Joe Kobylak, Berea, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 24, 1969, Ser. No. 869,363
Int. Cl. C08f 29/18, 45/42
U.S. Cl. 260—29.6 MH 5 Claims

Breathable polyvinyl chloride film in thicknesses from about 1 to 5 mils and having moisture vapor transmission rates above 50 are prepared by casting a mixture of a vinyl

chloride resin, solvent naphtha, a plasticizer and water and heating to dry and fuse the film.

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**3,644,260**

## COATING COMPOSITIONS CONTAINING FLUOROCARBON POLYMER AND ALKYL SILICATE

**Clifford Hugh Strolle, Springfield, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Nov. 3, 1969, Ser. No. 873,624**
**Int. Cl. C08f 45/24, 45/34**
**U.S. Cl. 260—29.6 F** **6 Claims**

A composition for priming a surface to improve adhesion of a fluorocarbon polymer topcoat. The composition contains an alkyl silicate, a particulate fluorocarbon polymer and a liquid carrier.

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**3,644,261**

## COATING COMPOSITIONS CONTAINING FLUOROCARBON POLYMER AND ALUMINUM BOROPHOSPHATE

**Clifford Hugh Strolle, Springfield, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Nov. 3, 1969, Ser. No. 873,633**
**Int. Cl. C08f 45/24**
**U.S. Cl. 260—29.6 F** **7 Claims**

A composition for priming a surface to improve the adhesion of a fluorocarbon polymer topcoat. The composition contains about 50–90 percent fluorocarbon polymer by weight and 10–50 percent aluminum borophosphate by weight and a liquid carrier.

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**3,644,262**

## PROCESS FOR INCREASING THE ETHYLENE CONTENT OF VINYL ACETATE-ETHYLENE EMULSION COPOLYMERS

**Peter Fallon Stehle, Media; Chan K. Wu, Philadelphia, both of Pa.; Samuel Loshaek, Stamford, Conn., and Jack Dickstein, Huntingdon Valley, Pa., assignors to Borden Inc., New York, N.Y.**

**Filed Nov. 5, 1969, Ser. No. 874,410**
**Int. Cl. C08f 45/22**
**U.S. Cl. 260—29.6 R** **5 Claims**

This invention relates to copolymerizing vinyl acetate and ethylene in aqueous emulsion in contact with a pressurized ethylene gas phase and in particular to a method of copolymerizing substantially larger amounts of ethylene into the copolymer than have heretofore been copolymerized at equivalent temperature and pressure, said method comprising adding vinyl acetate to an aqueous emulsifying composition containing initiator and maintained under ethylene pressure, the rate of vinyl acetate addition during copolymerization being such as to maintain the concentration of unpolymerized vinyl acetate at a level not exceeding about 3.5 percent by weight of the aqueous emulsifying composition. The resulting latexes of this invention are useful as adhesives and bases for paints and paper coatings.

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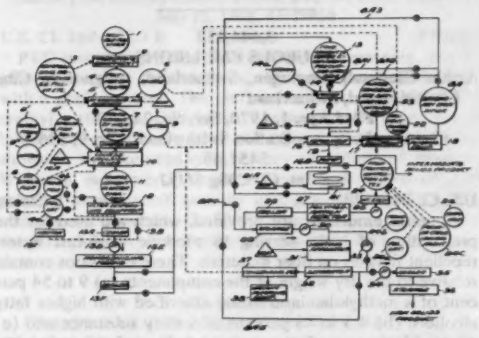
**3,644,263**

## HIGH POLYMER LATICES AND METHODS AND MEANS FOR PRODUCING SAME

**Oliver W. Burke, Jr., 506 Intracoastal Drive, Fort Lauderdale, Fla.**

**Continuation-in-part of application Ser. No. 621,997, Mar. 7, 1967, now Patent No. 3,503,917, Continuation-in-part of application Ser. No. 691,823, Dec. 19, 1967, now abandoned, Continuation-in-part of application Ser. No. 767,790, Oct. 15, 1968. This application Dec. 18, 1968, Ser. No. 784,596**
**Int. Cl. C08f 3/16, 47/18**
**U.S. Cl. 260—29.7 EM** **34 Claims**

The preparation of aqueous latices from solvent dispersions of elastomers and other high-polymer compositions has presented problems including excessive viscosity during processing and foaming and coagulation, which have produced losses and increased costs. Herein combinations of steps are disclosed which reduce or eliminate various of these problems, especially coagulum; enable the preparation of latices of high-solids content; enable preparation of high-solids content latices of grafted or filler-extended or filler-reinforced elastomers; enable preparation of high-solids



latices of low molecular weight polymer which are then modified to materially increase the molecular weight of the polymer; and enable the preparation of improved stable latices both dilute and of high-solids content, which are useful for example for adhesive and film-forming purposes. The process in common with that of related copending applications is characterized, inter alia, by the establishment of a flow of steam as a continuous phase into which an emulsion of a cement of the polymer is dispersed as an aerosol of latex droplets in a solvent-vapor continuum, followed by coalescence of the latex droplets and separation of the resulting coalesced liquid phase from the resulting solvent-vapor phase. In one embodiment of the present method an unstable emulsion is prepared employing only a limited quantity of emulsifier, so that the homogenizing thereof produces an emulsion the dispersed phase of which is only temporarily of precursor latex particle size. This unstable emulsion is converted to a stable latex by provisions for dispersing the same as the aerosol before coalescence of over 5 percent of the dispersed polymer phase of the emulsion into droplets of greater than precursor latex particle size, (or for stabilizing the same by the addition of a secondary emulsifier to the same before such condition is reached without further reducing the size of the cement droplets of the dispersed phase) so that the latex in the aerosol and separated therefrom is kept free of coagulum during the coalescing of the latex droplets and the separation and further treatment, e.g., stripping and concentrating, with or without correlated further additions or emulsifier to stabilize the latex for storage or use.

The separation of the gaseous and liquid latex phases is preferably effected with the aid of partially concentrated liquid latex; and in certain embodiments herein disclosed a mixture of such partially concentrated latex commingled with water vapor generated therefrom is added to and commingled with the aerosol before or after at least a part of the aerosol has been coalesced, and the combined liquid phases and combined gas phases of the resulting mixture are thereafter separated. Also in certain embodiments of the invention a liquid flow of secondary emulsifier may be added to the uncoalesced or partially coalesced aerosol, or to the mixture thereof with the partially concentrated latex, prior to the separation of the gaseous and liquid phases thereof.

3,644,264

## N-ALKYL PYRROLIDONE-PLASTICIZED COPOLYLACTAM COMPOSITIONS

Thomas J. Hyde, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 710,771, Mar. 6, 1968, now abandoned. This application Aug. 1, 1969, Ser. No. 846,974

Int. Cl. C08g *51/44*

U.S. Cl. 260—30.2 R 14 Claims

Polymerizable lactam compositions comprising an anionic catalyst, a polymerization promoter, 50 to 90 percent of caprolactam, at least 1 percent of a lactam having seven to 12 carbon atoms in the lactam ring, and 2 to 20 percent of the plasticizer N-alkyl pyrrolidone, and the manufacture of impact-resistant articles by casting and anionically polymerizing the mixture.

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3,644,265

## STABILIZED SOLUTIONS OF ACRYLONITRILE-VINYLIDENE CHLORIDE COPOLYMERS

Carlhans Suling, Odenthal-Hahnenberg; Heino Logemann; Dieter Kramer, both of Leverkusen; Heinz Rachwalsky, and Herbert Marzolph, both of Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 6, 1968, Ser. No. 781,957

Claims priority, application Germany, Dec. 15, 1967, P 16 94 233.9

Int. Cl. C08f *45/60*

U.S. Cl. 260—32.6 N 5 Claims

This invention relates to a stabilized solution of a copolymer from acrylonitrile and vinylidene chloride in an organic solvent, the chlorine content of the copolymer is in the range from 20 to 60 percent by weight based on the polymer. The solution of the copolymer contains a salt of a mercapto sulphonic acid with a guanidine as stabilizing agent, said salt is present in the solvent in the range of from 0.001 to 5 percent by weight based on the polymer.

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3,644,266

## SAND CONSOLIDATION COMPOSITION

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Original application Dec. 23, 1968, Ser. No. 786,368, now Patent No. 3,537,522, dated Nov. 3, 1970. Divided and this application Dec. 31, 1969, Ser. No. 21,228

Int. Cl. C08f *45/34*

U.S. Cl. 260—32.8 R 9 Claims

Method of and composition for the treatment of unconsolidated sandy formations to stabilize the formation comprising injecting a treating composition of 2–25 percent of acrolein dimer and 75–98 percent of an aromatic-type solvent into said formation, effecting polymerization of said dimer by contact with an acid forming polymerization catalyst and water, and formation of a fluid permeable consolidated sand in said formation.

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3,644,267

## LOW-VISCOSITY HIGH-STRENGTH THERMOPLASTIC ADHESIVE

Winston J. Jackson, Jr., and John R. Caldwell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1970, Ser. No. 6,645

Int. Cl. C08g *39/10*, *51/28*

U.S. Cl. 260—33.6 R 6 Claims

Low-viscosity high-strength thermoplastic adhesives comprising a thermoplastic linear polyester, a polymer of a monoolefinically unsaturated monomer, a viscosity decreasing additive and optionally a granular metallic material. Substrates such as sheets, film or shaped articles are bonded together with the adhesive, or single substrates are coated therewith as when surface defects are to be eliminated. Useful viscosity decreasing additives include chlorinated biphenyl, terphenyl and other aromatic compounds having a boiling point above about 250° C. and a Tg below about 10° C.

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3,644,268

## TREATING RUBBER TO ENHANCE FIBER BONDING

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed July 31, 1970, Ser. No. 60,161

Int. Cl. C08d *9/10*

U.S. Cl. 260—38 7 Claims

Fiber to rubber adhesion is enhanced by incorporating into the rubber a formaldehyde donor and a saturated polymer comprising alkylene bridged resorcinol.

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3,644,269

## COLLAPSIBLE MOLD AND MOLDING COMPOSITIONS

Howard Eugene Hoyt, Huntingdon Valley, Pa., and Robert B. Dean, Cincinnati, Ohio, assignors to Borden, Inc., New York, N.Y.

Continuation of application Ser. No. 463,342, June 11, 1965, now abandoned, which is a continuation of application Ser. No. 856,345, Dec. 1, 1959, now abandoned. This application Nov. 5, 1969, Ser. No. 871,528

Int. Cl. C08g *5/10*

U.S. Cl. 260—38 9 Claims

This invention relates to molding compositions, collapsible molds made therefrom, and the method of making such molds wherein granules of a solid nonabsorbent material are coated with a nontacky layer comprising a potentially unstable thermosetting resin selected from the group consisting of the reaction products of formaldehyde with an isoalkylidene bisphenol and formaldehyde with phenol and an isoalkylidene bisphenol, said resin being an alkaline condensation product which has not been precipitated in acid.

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3,644,270

## PROCESS FOR COLORING POLYESTERS WITH RHODAMINE, XANTHENE OR BENZOPHENYL SAFRANINE DYES

George Devasia Vallaveedan, Freehold Township, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1969, Ser. No. 818,139

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R 6 Claims

A process for mass-coloring polyesters characterized that there is admixed with the bis(hydroxyalkyl) aromatic dicarboxylic acid ester before carrying out a polyesterification or condensation, one or more ionic-polycyclic-heterocyclic dyestuffs selected from the group of substituted xanthylium and 5-6 mono- and 1-2, 5-6 dibenzophenazinium sodium and ammonium salts during the polymerization. Polyethylene terephthalate can be colored in this way and formed into colored films and filaments.

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3,644,271

## COMPOSITION AND PROCESS FOR INJECTION MOLDING THERMOPLASTIC MATERIAL AND GLASS FIBERS

Frederick T. Tulley, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,921

Int. Cl. C08f *45/10*; B28b *1/24*

U.S. Cl. 260—41 6 Claims

A composition and process for the manufacture of shaped articles by injection molding of thermoplastic material and glass fibers. The process involves the heating and masticating of from about 20 to about 40 percent weight thermoplastic material in the form of a powder having a particle size from about 30 to about 200 mesh, with from about 40 percent to

about 60 percent weight of the same thermoplastic material in the form of pellets having a maximum dimension of about 1/16 inch to about 3/8 inch, together with from about 20 to about 40 percent weight of glass fibers having a maximum length of about 1/16 inch. The mixture is then injection molded to produce the article.

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3,644,272

## MODACRYLIC FIBERS CONTAINING COMPOUNDS OF THE AZULENE SERIES

Marshall V. Otis, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 13, 1970, Ser. No. 54,600
Int. Cl. D06p 3/70; C08f 45/14
U.S. Cl. 260—41 13 Claims

A modacrylic textile fiber having uniformly dispersed therein, based on the weight of the fiber, from about 0.001 to about 0.01 weight percent of an acetone-soluble whitening agent of the azulene series.

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3,644,273

## MELT FLOW STABILIZATION OF POLYOLEFINS

Kenneth R. Mills, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 4, 1969, Ser. No. 882,350
Int. Cl. C08f 45/04, 45/56
U.S. Cl. 260—41 A 10 Claims

A method of incorporating a polymer melt flow stabilizer into a polymer by absorbing the stabilizer in a porous absorbent and incorporating the stabilizer-containing absorbent in the polymer.

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3,644,274

## FURAN NO-BAKE FOUNDRY BINDERS

Frank A. Maurukas, Cicero, Ill., assignor to CPC International Inc.

Filed Dec. 22, 1969, Ser. No. 887,367
Int. Cl. C08f 45/04
U.S. Cl. 260—41 A 13 Claims

Describes a process for the acid-catalyzed polymerization of a fusible furan resin, by incorporating a source of fluoride ion in the acid catalyst. Also covers the process for forming foundry cores or molds from sand using a fusible furan resin binder and an acid catalyst that contains a source of fluoride ion.

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3,644,275

## METHOD FOR THE REDUCTION OF PHOTOCHEMICAL DEGRADATION IN POLYURETHANES

Albert Thomas Betts, 35, Stonyshotts, Waltham Abbey, and Norbert Url, 27, Chestnut Close, London, N. 14, both of England

Continuation-in-part of application Ser. No. 652,698, July 12, 1966, now Patent No. 3,546,159. This application Aug. 21, 1970, Ser. No. 66,101
Int. Cl. C08g 51/56
U.S. Cl. 260—45.7 R 6 Claims

A composition having improved resistance toward photochemical degradation comprises a polyurethane containing at least about 0.01 percent by weight of a dissolved alkali metal fluoride selected from the group consisting of caesium, rubidium, potassium and sodium fluoride.

3,644,276

## ORTHOESTER STABILIZED POLYVINYL CHLORIDE RESINS

Louis L. Wood, 11715 Smoketree Road, Potomac, Md.

Continuation-in-part of application Ser. No. 736,256, June 12, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 612,066, Dec. 14, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 499,093, Oct. 20, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 403,353, Oct. 13, 1964, now abandoned. This application Jan. 30, 1970, Ser. No. 7,258
Int. Cl. C08f 45/58
U.S. Cl. 260—45.8 A 9 Claims

Vinyl chloride resins are stabilized with orthoesters derived by the condensation of lower alkyl substituted orthoesters with polyhydric alcohols such as glycerol, sorbitol, mannitol, 1,2,4 butane triol, and 1,2,6 hexane triol.

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3,644,277

## PHENOLIC ISOCYANURATES USED AS STABILIZERS

Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Original application Oct. 25, 1968, Ser. No. 770,846. Divided and this application Sept. 28, 1970, Ser. No. 76,259
Int. Cl. C08f 45/60
U.S. Cl. 260—45.8 N 13 Claims

Novel mixed esters of isocyanuric acid have been prepared. These bis-(hydroxyphenylalkylene)alkyl isocyanurate compounds provide excellent stabilization for organic materials against oxidative, thermal and photochemical degradation. The stability of α-monoolefin homopolymers and copolymers is particularly enhanced by the use of stabilizing amounts of the bis-(hydroxybenzyl)isocyanurates.

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3,644,278

## SUBSTITUTED HYDROXYLAMINE STABILIZERS

Peter Klemchuk, Yorktown Heights, N.Y., assignor to Ciba-Geigy Corporation, Ardsely, N.Y.

Filed Mar. 4, 1968, Ser. No. 709,882
Int. Cl. C08f 45/60, 45/62
U.S. Cl. 260—45.8 N 5 Claims

Substituted hydroxylamines exhibit activity and antioxidants for a diverse group of substrate materials above specific conditions of exposure to an oxidizing environment. Illustrative embodiments of substituted hydroxylamine antioxidants are bis(p-nitrobenzyl)hydroxylamine and 2-diethylamino-4,6,-bis(N-n-propyl-N-hydroxyamino-s-triazine.

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3,644,279

## POLYMERS OF MONO-1-OLEFINS STABILIZED AGAINST DEGRADATION BY ULTRAVIOLET LIGHT

Ronald D. Mathis and Jack P. Guillory, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,819
Int. Cl. C08f 45/58, 45/60
U.S. Cl. 260—45.8 N 7 Claims

Carbazole, indole, a hydrocarbyl - substituted form thereof or an amide thereof is added to a monoolefin polymer to stabilize it against the effects of ultraviolet light. Di - n - octadecyl-3,5-di-tert-butyl-4-hydroxy benzyl phosphonate is used in combination with the ultraviolet light stabilizers.

3,644,280

## STABILIZATION OF POLYCAPROLACTAM WITH A MIXTURE OF A DI-SUBSTITUTED PHENYLENE DIAMINE AND A TRI(ALKYLPHENYL) PHOSPHITE

Joseph H. Tazewell, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,172

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.9 R 10 Claims

Nylon 6 is stabilized with a trialkylphenyl phosphite and di-beta-naphthyl-para-phenylenediamine.

3,644,281

## STABLE ORGANIC COMPOSITIONS CONTAINING A PHENOLIC ANTIOXIDANT

Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Original application July 9, 1965, Ser. No. 470,890, now Patent No. 3,579,561, dated May 18, 1971. Divided and this application Jan. 22, 1970, Ser. No. 5,099

Int. Cl. C08c *27/66*; C08d *11/04*; C08f *45/58*

U.S. Cl. 260—45.85 11 Claims

Hydroxybenzylphenyl carbonates and carboxylates are useful as stabilizers for organic material. They may be used alone or in combination with a dihydrocarbylthiodialkanoate.

3,644,282

## TERNARY STABILIZER SYSTEM FOR POLYOLEFINS

Clarence R. Bresson, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,746

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.85 6 Claims

A polymer stabilizer comprising mixtures of diesters of thiodicarboxylic acids. In another embodiment, said polymer stabilizer further comprises at least one hindered mono or polyphenolic compound. In another embodiment, said diesters of thiodicarboxylic acids are produced by reacting a mixture of alcohols characterized by the formulas ROH and R'OH wherein R and R' are the same or different and are hydrocarbon radicals selected from the group consisting of alkyl or cycloalkyl-substituted alkyl in the range of from 10 to 20 carbon atoms per R and R' group with at least one thiodicarboxylic acid of the formula $S—(C_nH_{2n}COOH)_2$ wherein *n* is an integer from 1 to 6.

3,644,283

## AROMATIC AZO BLOCK COPOLYMERS

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 715,161, Mar. 22, 1968. This application Aug. 20, 1970, Ser. No. 65,711

Int. Cl. C08g *20/20*, *20/32*, *33/02*

U.S. Cl. 260—47 CZ 5 Claims

Aromatic azo block copolymers having an azo group containing wholly aromatic block polymer unit and a second wholly aromatic non-azo block polymer unit are prepared and are useful in the preparation of fibers, filaments, films and other shaped articles for application where thermal resistance, light stability, semi-conducting and photochromic properties are desired.

3,644,284

## ELASTOMERIC COMPOSITION CONTAINING POLYESTER STABILIZERS

Richard D. Cassar, West Chester, Pa., and Jackson S. Boyer, Northridge, Claymont, Del., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,874

The portion of the term of the patent subsequent to Feb. 9, 1988, has been disclaimed

Int. Cl. C08c *27/66*; C08f *45/58*

U.S. Cl. 260—45.85 R 14 Claims

An elastomeric composition having improved resistance to ultraviolet initiated degradation comprising an elastomer containing an ultraviolet stability improving quantity of a polyester of a polymethylated muconic acid selected from the group consisting of $\alpha,\beta'$-dimethylmuconic acid, $\alpha,\alpha'$-dimethylmuconic acid, $\alpha,\alpha',\beta$-trimethylmuconic acid, $\alpha,\beta,\beta'$-trimethylmuconic acid, $\alpha,\alpha',\beta,\beta'$-tetramethylmuconic acid and mixtures thereof with a polyethylene glycol of a molecular weight in the range of 100 to 1000, said polyester having a molecular weight in the range of 600 to 20,000.

3,644,285

## POLYAROMATIC PYRAZINES

Jerry G. Higgins, Normal, Ill., assignor to Research Corporation, New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,154

Int. Cl. C08g *33/02*

U.S. Cl. 260—47 R 7 Claims

Polyaromatic pyrazines having high-temperature stability are prepared by the condensation of bis-α-halo-aromatic ketones with ammonia, said polymers having utility in the form of film and fibers.

The solubility of polymeric polyaromatic polyimides is increased by heating with peroxides, preferably in the presence of a strong acid.

3,644,286

## RETICULATED POLYAMIDES AND METHOD OF PREPARATION

Jean Odier, Antony, France, and Joerg Sambeth, Carouge, Geneva, and Friedrich Grundschober, Confignon, Geneva, Switzerland, assignors to Societe Anonyme Francaise du Ferodo, Paris, France

No Drawing. Filed June 5, 1968, Ser. No. 784,959

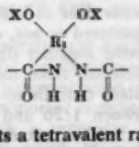
Claims priority, application France, June 5, 1967, 109,040

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. C08g *33/02*

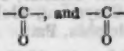
U.S. Cl. 260—47 CP 25 Claims

Reticulated polyamide comprising divalent radicals and trivalent radicals which may be aliphatic or aromatic radicals, substituted or not, or a plurality of aromatic radicals linked together either directly or by at least one radical selected from the group comprising the alkyl, dioxy-alkyl, cyclanilidenes, —S—, —$SO_2$—, —O—, —CO— radicals, the divalent radicals and the trivalent radicals being linked together by the structure:



in which $R_3$ represents a tetravalent radical which may be an aromatic radical, substituted or not, or a number of

aromatic radicals linked together directly or by at least one radical selected from the group of radicals recited above; X representing a hydrogen or at least one of the three radicals: $R_4$,



in which $R_4$ represents an alkyl or aryl radical having each OX group fixed directly on a carbon atom of the tetravalent radical, in the ortho or peri position with respect to the carbon atom on which is fixed the amide group —NH CO—, the ratio of the trivalent radicals to the divalent radicals being comprised between 1:20 and 1:5. The method of preparation comprises essentially the reaction of one or more diamine compounds with at least one compound of dicarboxylic acid and at least one compound of tricarboxylic acid.

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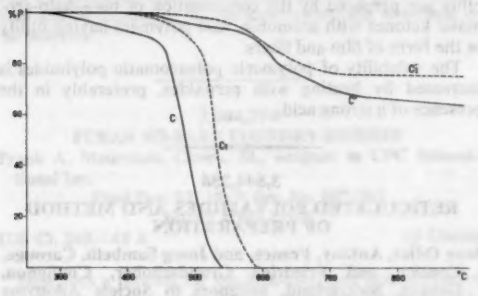
**3,644,287**

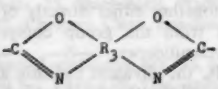
## METHOD OF PREPARING RETICULATED POLYBENZOXAZOLE

**Jean Odier, Antony, France, and Joerg Sambeth, Carouge, Geneva, and Friedrich Grundschober, Confignon, Geneva, Switzerland, assignors to Societe Anonyme Francaise du Ferodo, Paris, France**

**Filed June 5, 1968, Ser. No. 784,960**
**Claims priority, application France, June 5, 1967, 109,042**
**(Filed under Rule 47(a) and 35 U.S.C. 116)**
**Int. Cl. C08g *33/02***
**U.S. Cl. 260—47 CP** **7 Claims**




Reticulated polybenzoxazole comprising divalent and trivalent aliphatic or aromatic radicals, substituted or not, or a plurality of aromatic radicals bound to each other either directly or by at least one of the radicals selected from the group comprising the alkyl, dioxy-alkyl, cyclanilidenes, —S, —$SO_2$—, —O—, —CO-radicals, said divalent radicals and said trivalent radicals being coupled together by the structure:



in which $R_3$ is a tetravalent radical which may be an aromatic radical, substituted or not, or a plurality of said aromatic radicals bound together directly or by at least one of the radicals selected from the group cited above, the ratio of the trivalent radicals to the divalent radicals being comprised between 1:20 and 1:1 and preferably between 1:20 and 1:5. The reticulated polybenzole can be produced in the form of shaped or moulded objects. The method of preparation comprises essentially a gradual heating of a reticulated alkoxyl polyamide mixed with pyridine hydrochloride in excess and brought up to a temperature between 180° and 220° until the cyclization is complete.

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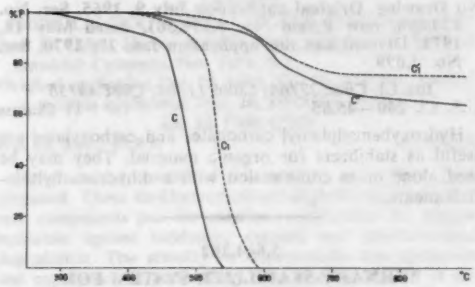
**3,644,288**

## METHOD OF PREPARING RETICULATED POLYBENZOXAZOLES

**Jean Odier, Antony, France, and Joerg Sambeth, Carouge, Geneva, and Friedrich Grundschober, Confignon, Geneva, Switzerland, assignors to Societe Anonyme Francaise du Ferodo, Paris, France**

**Filed June 5, 1968, Ser. No. 784,961**
**Claims priority, application France, June 5, 1967, 109,041**
**(Filed under Rule 47(a) and 35 U.S.C. 116)**
**Int. Cl. C08g *33/02***
**U.S. Cl. 260—47 CP** **6 Claims**




Reticulated polybenzoxazoles and a method of their manufacture, comprising divalent radicals $R_1$ and trivalent radicals $R_2$ which may be aliphatic or aromatic radicals, substituted or not, or a plurality of aromatic radicals bound to each other either directly or by at least one of the radicals selected from the group comprising the radicals: alkyl, dioxy-alkyl, cyclanilidenes, —S—, —$SO_2$—, —O—, —CO—, said divalent radicals and trivalent radicals being bound together by the structure:

in which $R_3$ represents a tetravalent radical which may be an aromatic radical, substituted or not, or a plurality of said radicals coupled together directly or by at least one of the radicals selected from the group comprising the radicals: alkyl, dioxy-alkyl, cyclanilidenes, —S—, —$SO_2$—, —O—, —CO—, the ratio of the trivalent radicals to the divalent radicals being comprised between 1:20 and 1:1, and preferably between 1:20 and 1:5.

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**3,644,289**

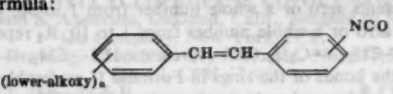
## LIGHT SENSITIVE POLYURETHANES PREPARED FROM HYDROXYL CONTAINING POLYMER AND AN ISOCYANATO-STILBENE COMPOUND

**Adnan A. R. Sayigh and Fred A. Stuber, New Haven, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Filed May 29, 1969, Ser. No. 829,100**
**Int. Cl. C08g *22/00, 22/22***
**U.S. Cl. 260—47 CB** **8 Claims**

Light-sensitive polyurethanes are prepared by reacting (a) a polymer having a free hydroxyl group in the re-

curring unit thereof with (b) an isocyanato-stilbene of the formula:




wherein *n* is an integer from 1 to 3. The above polyurethanes undergo cross-linking on exposure to ultraviolet light and, accordingly, can be used in photoresist systems.

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**3,644,290**

## ELASTIC MOULDING COMPOSITIONS OF POLYACETALS AND PROCESS FOR THEIR MANUFACTURE

**Karl-Heinz Häfner, Bad Orb, and Harald Cherdron, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Filed Dec. 2, 1968, Ser. No. 780,568**
**Claims priority, application Germany, Dec. 8, 1967, F 54,257**
**Int. Cl. C08g *22/14***
**U.S. Cl. 260—67 TN** **4 Claims**

Elastic moulding compositions on the basis of polyacetals are prepared by reacting copolymers of trioxane containing free amino groups with polyethers containing isocyanate groups. The elastic moulding compositions so obtained are thermoplastic and distinguished by high impact strength and are used alone or in admixture with polyacetals to form shaped particles.

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**3,644,291**

## TITANIUM COMPOUNDS AS POLYCONDENSATION CATALYSTS IN PREPARATION OF LINEAR POLYESTERS

**John A. Price, Swarthmore, and Mary J. Stewart, Riddlewood, Pa., assignors to FMC Corporation, Philadelphia, Pa.**

**No Drawing. Filed Nov. 20, 1968, Ser. No. 777,460**
**Int. Cl. C08g *17/015***
**U.S. Cl. 260—75 R** **10 Claims**

Process for preparing linear polyesters comprising carrying out an ester-interchange reaction between a diol and a lower dialkyl ester of a saturated aromatic dicarboxylic acid or carrying out a direct esterification reaction between a diol and a saturated aromatic dicarboxylic acid and then polycondensing the reaction product thereof in the presence of a polycondensation catalyst selected from the group consisting of titanium (III) oxalate, titanium oxyacetylacetonate, titanium disulfide, titanium phosphide, titanium (II) acetylacetonate, sodium titanium silicate, titanium tri-acetylacetonate, and titanium ammonium citrate.

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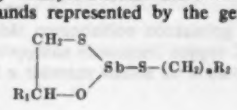
**3,644,292**

## ORGANO MERCAPTO-ANTIMONY COMPOUND AS POLYCONDENSATION CATALYSTS

**Mary J. Stewart, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.**

**No Drawing. Filed Nov. 27, 1968, Ser. No. 779,595**
**Int. Cl. C08g *17/015***
**U.S. Cl. 260—75 R** **6 Claims**

Process for preparing linear polyesters comprising carrying out an ester-interchange reaction between a diol and a lower dialkyl ester of a saturated aromatic dicarboxylic acid or carrying out a direct esterification reaction between a diol and a saturated aromatic dicarboxylic acid and then polycondensing the reaction product thereof in the presence of a catalytic amount of a mercapto-antimony catalyst selected from the group consisting of compounds represented by the general formula:




**3,644,293**

## INHIBITING ETHERIFICATION IN CATALYTIC ESTERIFICATION

**Glenn D. Fielder, Beaumont, Tex., assignor to Mobil Oil Corporation**

**No Drawing. Filed Dec. 30, 1968, Ser. No. 788,056**
**Int. Cl. C08g *17/003, 17/013*; C07c *67/00***
**U.S. Cl. 260—75 R** **8 Claims**

Undesired ether formation is suppressed in catalytic esterification by introducing ammonia or preferably an amine (e.g. trimethylamine) in a reaction mixture containing a carboxylic acid (e.g. terephthalic acid), an alcohol (e.g. ethylene glycol) and an organo-titanium or organo-zirconium esterification catalyst, such as diisopropyl di-triethanolamine titanate. It is often preferable to use a volatile nitrogenous base that can be readily stripped from the reaction mixture, especially at temperatures suitable for condensation of the product ester into the low molecular weight polyesters known as "prepolymer."

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**3,644,294**

## PROCESS AND EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF POLYESTERS

**Francesco Siclari, Cesano Maderno, and Franco Magnoni, Milan, Italy, assignors to Snia Viscosa Società Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy**

**Filed Apr. 4, 1969, Ser. No. 813,628**
**Claims priority, application Italy, Apr. 11, 1968, 15,146/68**
**Int. Cl. C08g *17/001***
**U.S. Cl. 260—75 M** **14 Claims**

A process for continuous production of a spinnable polyester including a plurality of steps of precondensation and of progressive condensation accompanied by removal of gaseous co-products. The individual steps are carried on applying thin-layer technique within separate environments at differing temperature and pressure conditions and wherein the walls defining said environments are so heated to maintain the temperature gradient at the interface of wall and liquid thin layer within a small value preferably not greater than 6° C., and the said liquid thin-layer in each environment prevailingly consists of partially reacted product recycled in same environment. An equipment comprising a plurality of reaction environments, recycling means and surface heat-exchanging means for carrying out the process.

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**3,644,295**

## SATURATED LINEAR POLYESTERS CONTAINING A SALT OF CAMPHORSULFONIC ACID

**Mary J. Stewart, Riddlewood, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.**

**No Drawing. Filed May 14, 1969, Ser. No. 824,700**
**Int. Cl. C08g *39/04***
**U.S. Cl. 260—75 S** **11 Claims**

A polyester composition comprising a saturated linear polyester resin containing a minor amount of an ammonium or metal salt of camphorsulfonic acid.

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**3,644,296**

## PROCESS FOR THE HIGH-MOLECULAR-WEIGHT POLYMERIZATION OF LACTAMS

**Hendrik Bosch, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands**

**Filed Dec. 23, 1968, Ser. No. 785,970**
**Claims priority, application Netherlands, Dec. 22, 1967, 6717621**
**Int. Cl. C08g *20/18***
**U.S. Cl. 260—78 L** **2 Claims**

A process and apparatus are disclosed for the preparation of high-molecular-weight polymerization products by ionogenic catalytic polymerization of lactams, in which one portion of the monomer is mixed with a catalyst and another portion with a promoter for accelerating the polymerization, after which these two components are

mixed in the liquid state and introduced into a heated mould in which the polymerization takes place.

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3,644,297

## NOVEL HIGH TEMPERATURE RESISTANT RESIN HAVING N-ALKYLHYDRAZIDE UNITS AND A METHOD OF PRODUCING THEREOF

Hideo Sekiguchi, Yokohama, and Kazuo Sadamitsu, Tokyo, Japan, assignors to The Furukawa Electric Company Limited, Chiyoda-ku, Tokyo, Japan

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,060
Claims priority, application Japan, Jan. 22, 1968, 43/3,379, 43/3,380
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 21 Claims

Novel high temperature resistant resin having N-alkylhydrazide units whose alkyl group has 2 to 4 carbon atoms, is prepared by reacting polyoxadiazole with alkyl sulfate whose alkyl group has 2 to 4 carbon atoms in concentrated sulfuric acid. Thus obtained resin is fusible and soluble or insoluble in organic solvents and can be converted into polyoxadiazole again by heat-treatment which has higher temperature resistance.

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3,644,298

## PRODUCTION OF FIBER-FORMING POLYAMIDES OF IMPROVED DYEABILITY

Klaus Gerlach, Obernau, Wolfgang Grimm, Erlenbach, and Helmut Linhart, Aschaffenburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany

Filed Jan. 13, 1969, Ser. No. 790,640
Claims priority, application Germany, Jan. 13, 1968, P 17 20 886.5
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 14 Claims

Process for improving the dyeability of high molecular weight linear fiber-forming synthetic polyamides while retaining sufficient solution viscosity wherein there is added to the initial polyamide-forming monomeric reactant, prior to or during its conventional polycondensation, (A) an alkylene diamine such as hexamethylene diamine and (B) a carbonic acid ester such as ethylene carbonate. The resulting product has a much higher affinity for acid dyes while avoiding certain disadvantages of adding (A) or (B) alone.

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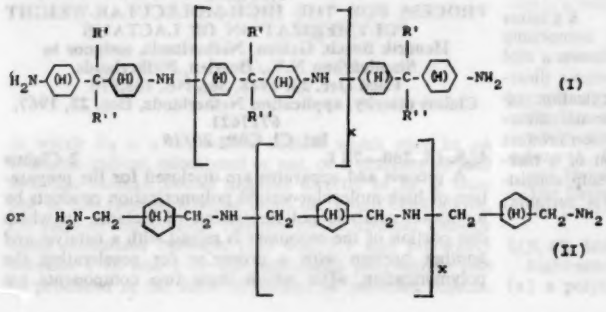
3,644,299

## FIBER-FORMING POLYAMIDES HAVING AN INCREASED CONTENT OF AMINO GROUPS

Walter Fester, Konigstein, Taunus, Ernst Hanschke, Burghausen (Salzach), and Franz Jakob, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,400
Claims priority, application Germany, Mar. 26, 1968, P 17 70 057.1
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 TF 6 Claims

Polyamides having an especially high dye affinity with respect to basic dyestuffs are obtained by adding certain amounts of a polyamine.



(I)

or



(II)

or a mixture of these polyamines, in which formulae $x$ represents zero or a whole number from 1 to 30, preferably zero or a whole number from 1 to 10, $R_2$ represents H, $-CH_3$, $-C_2H_5$, R'' represents H, $-CH_3$, $-C_2H_5$, and the bonds of the rings in Formula II preferably being meta- and para-bonds, to the polyamide-forming starting material or subsequently to the polyamide. From the modified polyamides fibers are obtained which have an improved dye affinity with respect to basic dyestuffs.

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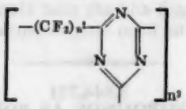
3,644,300

## CROSSLINKING OF PERFLUOROALKYLENE TRIAZINE POLYMER

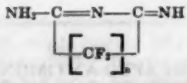
Edwin Dorfman and William E. Emerson, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 634,878, May 1, 1967. This application Apr. 14, 1969, Ser. No. 816,103
Int. Cl. C08f *15/06*; C08g *33/02*
U.S. Cl. 260—78.4 N 12 Claims

This invention is directed to the crosslinking of polymers containing at least one fluoroalkylene triazine unit typically of the formula:



in which $n^1$ is at least 4 up to about 20, $n^2$ is at least 1. However, the invention is also directed to any alkylene-triazine polymer having at least one fluorine substituent on the carbon adjacent to the triazine ring. Polymers of the general type of these polymers described above include the polymers of the copending application, Ser. No. 533,430, filed Mar. 11, 1966, for example. The cross-linking agent of this invention is selected from the group consisting of amidines and imidines, preferably halogenated alkyl imidines and amidines, a preferred embodiment being a perfluoroalkylene such as perfluoroglutarimidine. Representative amidines typically include perfluorosuberamidine and perfluorosebacamidine. The characteristic structure of the imidine of this invention is typically represented by the following formula:



in which $n$ is from 1 to 3.

3,644,301
**1-METHYLCYCLOPROPENE COPOLYMERS**
William S. Anderson, Oakland, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 20, 1969, Ser. No. 878,590
Int. Cl. C08f 17/00
U.S. Cl. 260—78.5 R 9 Claims

Novel copolymers of 1-methylcyclopropene useful for preparing adhesives, coatings, films, fibers and molded objects are disclosed. The copolymers are prepared by ordinary polymerization processes.

3,644,302
**PREPARATION OF THERMOSTABILISABLE POLYTHIIRANES**
Adrien Nicco and Bernard Boucheron, Bethune, France, assignors to Societe Ethylene-Plastique, Paris, France
No Drawing. Filed Dec. 10, 1968, Ser. No. 782,746
Claims priority, application Great Britain, Dec. 14, 1967, 56,856/67
Int. Cl. C08f 1/04, 1/74
U.S. Cl. 260—79 R 9 Claims

A process for the preparation of thermostabilisable polythiiranes in which is used at least one monomer selected from compounds of the group of thiirane and products obtained by substituting in thiirane at least one hydrogen atom by one alkyl radical having from 1 to 4 carbon atoms, characterized in that at least one phenyl phosphine out of the three phosphorus valences is used as a catalyst and that polymerization is effected in the absence of solvent or in the presence of at least one aprotic solvent, and the polymers thus obtained.

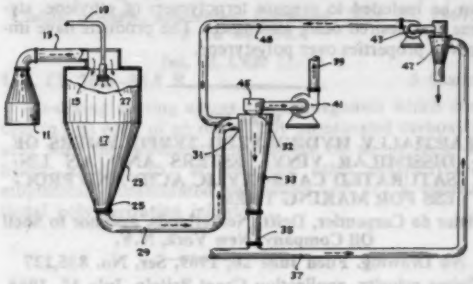
3,644,303
**PROCESS FOR THE PREPARATION OF MODIFIED POLYETHYLENE POWDERS**
Harald Berger, Kelkheim, Taunus, Herbert Bestian, Frankfurt am Main, and Helmut Korbanka, Gersthofen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning
No Drawing. Filed Nov. 25, 1969, Ser. No. 879,911
Claims priority, application Germany, Dec. 2, 1968, P 18 12 143.2
Int. Cl. C08f 15/02, 19/02
U.S. Cl. 260—79.3 R 5 Claims

A process for the preparation of pulverulent copolymers prepared by saponifying acrylamide-N-sulfonic acids consisting of ethylene structural units and vinyl-amide structural units, and possibly further structural units of ethylenically mono-unsaturated copolymerizable monomers. The modified polyethylene powders obtained in accordance with the invention are extremely suitable for the powdering of rubber sheets and/or rubber granules, for whirl-sintering coating, as a textile reinforcement to be ironed into the material, as a supporting base for pigment preparations, as a powder base for pharmaceutical or cosmetic preparations, as a lubricant for the tablet manufacture, as well as additives to polyester and polyvinyl chloride extrusion material in order to increase the flow property in the extrusion process and to improve the impact strength of such polymers.

3,644,304
**ETHYLENE-PROPYLENE-DIENE ELASTOMER**
Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed July 31, 1969, Ser. No. 846,608
Int. Cl. C08f 15/04
U.S. Cl. 260—79.5 B 9 Claims

A vulcanizable composition containing a diene modified ethylene-propylene elastomer, copper 2-mercaptobenzothiazole and a thiuram sulfide or a metal dithiocarbamate.

3,644,305
**SPRAY POLYMERIZATION**
Alvin J. Frisque, La Grange, and Robert Bernot, Chicago, Ill., assignors to Nalco Chemical Company, Chicago, Ill.
Filed Oct. 29, 1969, Ser. No. 872,319
Int. Cl. C08f 1/60
U.S. Cl. 260—80.3 N 3 Claims



A new process of polymerization is disclosed by the use of a spray dryer. Polymer gels and polymers of low molecular weight can be prepared by this spray polymerization method.

3,644,306
**HIGH MOLECULAR WEIGHT, VULCANIZABLE TERPOLYMERS OF ETHYLENE, PROPYLENE AND ALKENYLSILANES AND PROCESSES FOR THE PREPARATION THEREOF**
Paolo Longi and Francesco Greco, Milan, and Ermanno Bernasconi, Caronno Varesino, Varese, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
No Drawing. Continuation of abandoned application Ser. No. 686,688, Nov. 29, 1967. This application Aug. 18, 1969, Ser. No. 853,588
Claims priority, application Italy, Nov. 30, 1966, 30,561/66
Int. Cl. C08f 15/40
U.S. Cl. 260—80.71 5 Claims

There are disclosed crosslinked terpolymers obtained from high molecular weight, normally solid, essentially linear, addition terpolymers of ethylene, propylene and alkenylsilanes selected from the group consisting of vinylsilane, allylsilane, propenylsilane, butenylsilane, dimethylallylsilane, butenylallyl silane, cyclohexylallylsilane, and cyclohexylbutenylsilane, which terpolymers contain, by mols, from 65% to 80% of ethylene, from 20% to 35% of propylene, and from 0.02% to 5.0% of alkenylsilane. The crosslinked terpolymers are characterized in having Si—O—Si crosslinks between silicon atoms of the polymerized alkenylsilane units in different macromolecular chains of the terpolymers, as evidenced by examination of the infra-red spectra thereof. A process for obtaining the terpolymers with the aid of catalysts prepared from transition metal compounds and organometallic compounds of aluminum, and a process for crosslinking the terpolymers in a liquid non-solvent swelling agent for the terpolymers are also disclosed.

3,644,307
**ALKENE STYRENE POLYMERS**
Giovanni Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Aug. 19, 1969, Ser. No. 851,475
Int. Cl. C08f 1/13, 1/16
U.S. Cl. 260—80.73 9 Claims

A low molecular weight alkene such as ethylene is copolymerized with styrene by a low pressure emulsion or

suspension polymerization by incorporating a water soluble olefin complexing agent in the aqueous medium used in the polymerization. In a typical embodiment, ethylene is contacted with an aqueous emulsion of styrene, a peroxide catalyst and an ethylene complexing agent which is a water soluble salt of a multivalent metal. The polymerization can be performed at mild conditions of temperatures from about 10° to about 200° F. and pressures from about 10 to about 100 atmospheres. Other comonomers can be included to prepare terpolymers of ethylene, styrene and desired other monomers. The products have improved properties over polystyrene.

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3,644,308

## PARTIALLY HYDROLYZED TERPOLYMERS OF DISSIMILAR VINYL ESTERS AND AN UNSATURATED CARBOXYLIC ACID AND PROCESS FOR MAKING THEM

**Pieter de Carpentier, Delft, Netherlands, assignor to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed June 20, 1969, Ser. No. 835,227**

**Claims priority, application Great Britain, July 15, 1968, 33,600/68**

**Int. Cl. C08f** *27/14, 15/40*

**U.S. Cl. 260—80.75** **7 Claims**

Polymeric compounds useful as a superior baking enamel component are prepared by a process which comprises co-polymerizing (1) at least one vinyl ester of a saturated carboxylic acid, (2) at least one alpha, beta ethylenically unsaturated carboxylic acid, and (3) at least one vinyl ester of a saturated carboxylic acid having a tertiary or quaternary alpha carbon atom and partially hydrolyzing said polymerization product in an acid medium.

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3,644,309

## HYDROCARBON-SOLUBLE RUBBERY COPOLYMERS OF α-OLEFINS

**Edward William Duck, Dibden Purlieu, Southampton, John Howard Farmer, Southampton, and Brian John Ridgewell, Hythe, Southampton, England, assignors to The International Synthetic Rubber Company Limited, Southampton, England**

**No Drawing. Filed July 19, 1968, Ser. No. 745,982**

**Claims priority, application Great Britain, July 21, 1967, 33,661/67**

**Int. Cl. C08f** *15/04, 15/40;* **B01j**

**U.S. Cl. 260—80.78** **14 Claims**

A catalyst system for the preparation of homo- and copolymers of α-olefins comprises

(a) a hydrocarbon-soluble compound of vanadium, titanium or zirconium,

(b) a hydrocarbon soluble adduct of

(i) aluminium trichloride or aluminium dichlorohydride and

(ii) a polar compound, and

(c) an organo-metallic compound of lithium.

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3,644,310

## POLYMER COMPOSITIONS

**Hubert Brian Hopkins, Penarth, South Wales, assignor to Distrene Limited, London, England**

**No Drawing. Filed Nov. 22, 1968, Ser. No. 778,343**

**Claims priority, application Great Britain, Nov. 29, 1967, 54,264/67**

**Int. Cl. C08f** *7/04, 29/02;* **C08d** *5/02*

**U.S. Cl. 260—80.78** **12 Claims**

An antistatic agent composition for polymeric materials comprises a major proportion by weight of an alkyl or aryl or alkaryl sulphonate and a minor proportion by weight of an alkyl alkanolamide or a hydroxypolyalkoxyamide.

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3,644,311

## REDUCTION OF POLYMER BUILD-UP IN ETHYLENE COPOLYMERIZATION

**Bart A. Diliddo, Seven Hills, and Bernard F. Cinadr, Brecksville, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 772,373, Oct. 31, 1968. This application Nov. 3, 1969, Ser. No. 873,490**

**Int. Cl. C08f** *15/04*

**U.S. Cl. 260—80.78** **6 Claims**

In the suspension polymerization of ethylene, propylene and a polyene in the absence of substantial amounts of extraneous diluents, particularly in a continuous system, where polymer build-up interferes with the polymerization reaction and causes mechanical problems, the amount of polymer build-up is reduced by including in the polymerization system an aliphatic hydrocarbon solubilizing agent containing 6 to 10 carbon atoms which comprises from 5 to about 75% of the total of propylene and aliphatic hydrocarbons present in the reaction mixture.

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3,644,312

## PROCESS FOR POLYMERIZING CONJUGATED DIENES

**Tai Chun Cheng, Akron, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed Oct. 27, 1969, Ser. No. 869,877**

**Int. Cl. C08d** *1/32, 3/06;* **C08f** *15/04*

**U.S. Cl. 260—83.7 R** **17 Claims**

Conjugated dienes are polymerized by a new catalyst system which is more economically and more easily prepared and used than present catalyst systems used for similar purpose. This catalyst system comprises a combination of a free radical anion component modified by potassium hydroxide. The free radical anionic component is made, in an appropriate solvent, from an alkali metal and an anion forming compound, such as naphthalene. The catalyst system is used to polymerize conjugated dienes to polymer products of controlled molecular weight, suitable for easy processing and having properties desirable for ultimate use in tires and other molded products. The molecular weights of the products are increased by virtue of the modifier as compared to the molecular weights obtained with the radical anion component alone.

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3,644,313

## PROCESS FOR POLYMERIZING CONJUGATED DIENES

**Tai Chun Cheng, Akron, Thomas A. Antkowiak, Cuyahoga Falls, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed Oct. 27, 1969, Ser. No. 869,878**

**Int. Cl. C08d** *1/32;* **C08f** *1/28*

**U.S. Cl. 260—83.7 R** **23 Claims**

Conjugated dienes are polymerized by a new catalyst system which is more economically and more easily prepared and used than present catalyst systems used for similar purpose. This catalyst system comprises a combination of a free radical anion component modified by an alkali metal alkoxide or aryloxide. The free radical an-

ionic component is made, in an appropriate solvent, from an alkali metal and an anion forming compound such as naphthalene. The alkali metal compound is preferably potassium alkoxide or aryloxide, but can also be other alkali metal alkoxides or aryloxides. The catalyst system is used to polymerize conjugated dienes to polymer products of controlled molecular weight, suitable for easy processing and having properties desirable for ultimate use in tires and other molded products. The molecular weights of the products are increased by virtue of the modifier as compared to the molecular weights obtained with the radical anion component alone.

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3,644,314

## PREPARATION OF COPOLYMERS USING ORGANOLITHIUM/PYRIDINE COMPOUND CATALYST SYSTEM

**Akira Onishi, Shiro Anzai, Koichi Irako, Ryota Fujio, Yoshihiro Hayakawa, Minoru Kojima, and Hiroshi Kawamoto, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

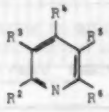
**No Drawing. Filed Dec. 13, 1968, Ser. No. 783,705**

**Claims priority, application Japan, Dec. 22, 1967, 42/81,899**

**Int. Cl. C08f** *1/28, 1/76, 15/04*

**U.S. Cl. 260—84.7** **17 Claims**

Random copolymer is prepared by copolymerizing a conjugated diene, such as 1,3-butadiene and a vinyl-substituted aromatic hydrocarbon, such as styrene at a temperature of −80° to 150° C. in the presence of a substantially anhydrous liquid hydrocarbon by means of a catalyst system consisting essentially of an organolithium compound and a pyridine compound having the formula



wherein $R^2$, $R^3$, $R^4$, $R^5$ and $R^6$ is selected from the group consisting of hydrogen and hydrocarbon radicals and at least two of them are hydrocarbon radicals selected from the group consisting of alkyl, alkenyl, cycloalkyl and aralkyl radicals.

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3,644,315

## MOISTURE-CURABLE POLYMERS

**Irwin J. Gardner, Fanwood, and Thomas A. Manuel, Westfield, N.J., assignors to Esso Research and Engineering Company**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 600,725, Dec. 12, 1966. This application Mar. 14, 1969, Ser. No. 807,433**

**Int. Cl. C08d** *3/02;* **C08f** *15/04*

**U.S. Cl. 260—85.3** **3 Claims**

Moisture-curable polymers are prepared by reacting an elastomeric or mastic copolymer of a $C_4$–$C_7$ isoolefin (e.g. isobutylene) with an acyclic conjugated diolefin yielding type II unsaturation in the copolymer backbone (e.g. butadiene or piperylene) with a silane (e.g. trichlorosilane) in the presence of a peroxide (e.g. benzoyl peroxide).

3,644,316

## PRODUCTION OF COATINGS AND IMPREGNATIONS COMPRISING ALKYLENE GLYCOL ACRYLIC ACETO ACETATE POLYMERS

**Matthias Marx, Bad Durkheim, Heinz Pohlemann, Limburgerhof, and Hans Klug, Lampertheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Nov. 25, 1968, Ser. No. 778,775**

**Claims priority, application Germany, Nov. 25, 1967, P 16 44 990.4**

**Int. Cl. C08f** *15/16*

**U.S. Cl. 260—85.5 R** **3 Claims**

Air-drying coating agents and impregnants which contain (a) an ester of an olefinically unsaturated carboxylic acid with the acetoacetic monoester of an at least dihydric alcohol; (b) at least one other polymerizable ethylenically unsaturated compound and (c) a conventional polymerization initiator.

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3,644,317

## PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

**Sergio Lo Monaco, Corrado Mazzolini, Luigi Patron, and Alberto Moretti, Venice, Italy, assignors to Chatillon Società Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy**

**No Drawing. Filed Dec. 12, 1968, Ser. No. 783,413**

**Claims priority, application Italy, Dec. 15, 1967, 23,916/67**

**Int. Cl. C08f** *3/30, 1/62, 1/80*

**U.S. Cl. 260—85.5** **9 Claims**

In the low-temperature polymerization of vinyl chloride alone, or in admixture with small quantities of other copolymerizable monomers, by using as a catalyst a catalytic system comprising an organic hydroperoxide, sulphur dioxide and a compound selected from the group consisting of alcohols, alcoholates, their derivatives and their mixtures, it is possible (according to the present invention) to stop the polymerization at the desired degree of conversion and to avoid post-polymerization in the reaction mixture as well as during the recovery of the monomers, by treating the reaction mixture with a water-soluble hydroxylamine salt such as the hydrochloride, sulphate, oxalate, phosphate or acetate.

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3,644,318

## PROCESS FOR THE POLYMERIZATION OF OLEFINS

**Bernd Diedrich and Karl Diether Keil, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Filed June 25, 1969, Ser. No. 836,589**

**Claims priority, application Germany, Aug. 21, 1968, P 17 95 197.2; June 6, 1969, P 19 28 772.0**

**Int. Cl. C08f** *1/56, 3/02*

**U.S. Cl. 260—88.2** **8 Claims**

Process for homo- and copolymerizing olefins in the presence of a mixed catalyst comprising, as component A, a reaction product of magnesium alcoholates with tetravalent halogenated titanium compounds and, as component B, organo-aluminum compounds. Already under a pressure of less than 20 atmospheres the yields per catalyst obtained are so high that the remainders of catalyst

need not be removed from the polymer. Optionally, products can also be prepared which have a very narrow molecular weight distribution and very good color and corrosion values.

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3,644,319

## AFTERTREATMENT OF VINYLIDENE FLUORIDE POLYMERS PREPARED IN THE PRESENCE OF ALKYLPEROXYDICARBONATE COMPRISING HEAT TREATMENT OF THE POLYMERS WITH WATER

Shigeru Seki and Hisao Sanada, Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Apr. 10, 1968, Ser. No. 720,365
Claims priority, application Japan, Apr. 20, 1967, 42/25,361
Int. Cl. C08f 3/22
U.S. Cl. 260—92.1 4 Claims

A vinylidene fluoride polymer obtained by polymerization with the use of organic peroxide as a catalyst is subjected, prior to drying, to a heat treatment at a temperature of from 70 to 120 degrees C. and in the constant presence of water in order to cause decomposition and removal of residual catalyst, whereby the thermal stability of the polymer is greatly improved. The heat treatment can be carried out by indirect heating from outside, by blowing steam into a suspension of the polymer in water, or by fluidized treatment of the polymer with steam.

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3,644,320

## PROCESS FOR PRODUCING HIGHLY CRYSTALLINE POLYOLEFINS

Shotaro Sugiura, Haruo Ueno, Hideo Ishikawa, and Takefumi Yano, Ube-shi, and Tuneo Shimamura, Onoda-shi, Japan, assignors to Ube Industries, Ltd., Ube-shi, Japan

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,423
Int. Cl. C08f 1/56, 3/10
U.S. Cl. 260—93.7 7 Claims

A process for producing solid, highly crystalline polyolefins which comprises polymerizing the alpha-olefins with a three-component catalyst system obtained by mixing together an organoaluminum compound, a titanium trihalide and either a trithiophosphite or trithiophosphate.

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3,644,321

## POLYOLEFIN PURIFICATION

Michio Koga and Masaru Kani, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

No Drawing. Filed July 16, 1969, Ser. No. 842,393
Claims priority, application Japan, July 17, 1968, 43/50,415; Mar. 19, 1969, 44/20,403
Int. Cl. C08d 5/00; C08f 3/06, 3/10
U.S. Cl. 260—93.7 4 Claims

After alcohol treatment, a polyolefin is treated with an alkaline aqueous solution of a pH value of at least 5 in which catalyst residue separates, thereby causing stratification and formation of an aqueous phase in which at least a majority part of the catalyst residue is suspended and an oil phase in which the polyolefin is suspended, and the aqueous phase is then separated from the oil phase. Purification is still further improved by a process step of neutralization of acidic substances prior to the alkaline solution treatment.

3,644,322

## POLYMERIZATION OF CONJUGATED DIENES AND MONOVINYL AROMATIC COMPOUNDS WITH MULTIFUNCTIONAL POLYMERIZATION INITIATORS

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,204
Int. Cl. C08d 1/32; C08f 1/74, 7/04
U.S. Cl. 260—94.2 8 Claims

An improved multifunctional polymerization is prepared in a two step process by reacting an organomonolithium compound with a polymerizable additive and then contacting the reaction mixture with a polyvinyl aromatic compound.

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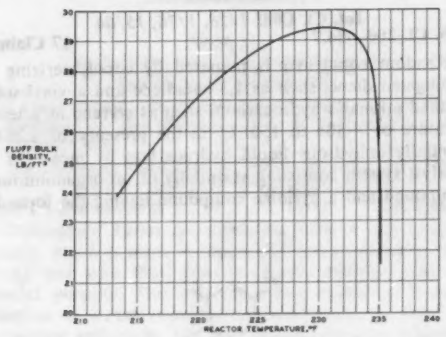
3,644,323

## PRODUCTION OF HIGH FLUFF BULK DENSITY PARTICLE-FORM POLYETHYLENES

Donald D. Norwood and Stanley J. Merwil, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed May 12, 1969, Ser. No. 823,832
Int. Cl. C08f 1/11, 1/66, 3/06
U.S. Cl. 260—94.9 D 5 Claims




A method of producing, in a slurry-type reactor, polyethylenes with a high fluff bulk density by operating the reactor within very close parameters of monomer concentration, temperature, pressure.

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3,644,324

## POLYMERS AND COPOLYMERS OF BUTADIENE, ETC., HAVING RELATIVELY WIDE MOLECULAR-WEIGHT DISTRIBUTION

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 749,593, Aug. 2, 1968. This application Feb. 2, 1970, Ser. No. 8,069
Int. Cl. C08d 5/04
U.S. Cl. 260—94.7 R 2 Claims

Polymers which are homopolymers of hydrocarbon conjugated dienes of 4 to 6 carbon atoms or copolymers of such dienes or copolymers of such dienes with styrene or a derivative of styrene, which polymers possess objectionable cold flow, are joined by use of a lithium-based catalyst and titanium chloride to produce a polymer having no cold flow. The resulting polymers and copolymers have a broadened molecular weight distribution and excellent mill-processability.

3,644,325

## USE OF AMMONIA IN THE PREPARATION OF CATALYSTS FOR OLEFIN POLYMERS HAVING IMPROVED PROCESSABILITY

Reginald F. Roberts, Jr., Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,345
Int. Cl. C08f 1/56
U.S. Cl. 260—94.9 C 5 Claims

Linear olefin polymers having improved processability are provided by low pressure polymerization of ethylene monomer in the presence of an aluminum alkyl and titanium trichloride which has been pretreated with a small amount of ammonia.

3,644,326

## EXTRACTING PROTEINS FROM LACTOSERUM

Jean Lucien Joseph Pien, Paris, France, assignor to Genvrain, Paris, France

Filed Nov. 25, 1968, Ser. No. 778,537
Claims priority, application France, Nov. 30, 1967, 130,410
Int. Cl. A23c 19/02, 21/00; A23j 1/20
U.S. Cl. 260—122 11 Claims

Proteins in lactoserum are continously extracted by a process involving the steps of adjusting the pH to between 6.2 and 6.4, heating to 90–100° C. for 10 to 30 minutes, acidifying to between pH 4.4 and 4.9 to precipitate the proteins, cooling to 20–60° C. and centrifuging to separate the proteins.

3,644,327

## AROMATIC AZOXY COMPOUNDS FROM AROMATIC NITROSO COMPOUNDS

Martin A. Robinson, Orange, and Thomas J. Hurley, Jr., Madison, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,835
Int. Cl. C07c 105/00
U.S. Cl. 260—143 8 Claims

A process for preparing an aromatic azoxy compound by reacting an aromatic nitroso compound with carbon monoxide at an elevated temperature and elevated pressure.

3,644,328

## SYMMETRICAL AROMATIC DIAMINES CONTAINING A CENTRAL AZO LINKAGE

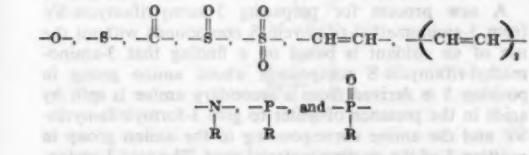
Hartwig C. Bach and Helmuth E. Hinderer, Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,243
Int. Cl. C07c 107/06; C09b 27/00, 43/06
U.S. Cl. 260—169 4 Claims

Symmetrical aromatic diamines are provided having the formula

$$NH_2—A_r(X)_nA_r—N=N—A_r(X)_nA_r—NH_2$$

wherein $n$ is 0 or 1, X is a divalent radical selected from the group consisting of



wherein R is a lower alkyl radical and Ar is a divalent aromatic single ring, fused ring, or multi-nuclear ring system, wherein the rings of said multi-nuclear ring system are connected only through aromatic carbon to aromatic carbon valence bonds or X radicals, with the proviso that where Ar is phenylene, $n$ is 1. The symmetrical azo aromatic diamine products are useful for the preparation of fiber and film forming polyimides having outstanding thermal resistance and mechanical properties.

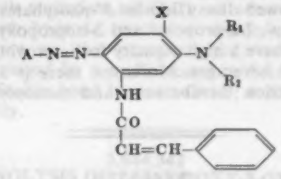
3,644,329

## WATER-INSOLUBLE MONO-AZO DYESTUFFS CONTAINING A CINNAMOYLAMINE COUPLING COMPONENT

Jean Marie Louis Le Roy, Saint-Etienne-du-Rouvray, and Claude Marie Henri Emile Brouard, Sotteville-les-Rouen, France, assignors to Ugine Kuhlmann, Paris, France

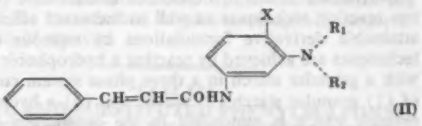
No Drawing. Filed Mar. 11, 1969, Ser. No. 806,319
Claims priority, application France, Mar. 21, 1968, 144,667
Int. Cl. C09d 29/00
U.S. Cl. 260—207.1 5 Claims

Dyestuffs, containing no acid groups, of the formula:


(I)

in which A represents the residue of a diazotisable amine, $R_1$ and $R_2$ each represent an alkyl group having up to four carbon atoms and X represents a hydrogen atom or a methyl, ethyl, methoxy or ethoxy group.

Coupling compounds of the formula:


(II)

in which $R_1$, $R_2$ and X have the meanings given above.

The dyestuffs are of particular interest for the colouration of hydrophobic fibres and processes for the preparation of the dyestuffs and the coupling compounds are disclosed.

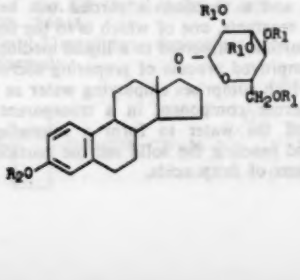
3,644,330

## DERIVATIVES OF ESTRADIOL-17β-GLUCOSIDES

Wolfgang Eberlein, Biberach an der Riss, Joachim Helder, Warthausen-Oberhofen, and Hans Machleidt and Gunther Engelhardt, Biberach an der Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

No Drawing. Filed May 1, 1969, Ser. No. 821,557
Claims priority, application Germany, May 3, 1968, P 17 68 351.1–42
Int. Cl. C07c 173/00
U.S. Cl. 260—210.5 4 Claims

Estrogenic estradiol-17β-glucoside derivatives of the formula



wherein

$R_1$ is hydrogen or lower alkanoyl, preferably acetyl, and $R_2$ is lower alkyl, lower alkanoyl, tetrahydropyranyl, or $MeO_3S$—, where Me is an alkali metal; the compounds are useful for the treatment of the menopausal syndrome, amenorrhea, endometritis and colpitis.

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3,644,331
**LOWER ALKOXY INOSINE-5'-PHOSPHATES AND SALTS THEREOF**

**Ryuji Marumoto, Minoo, Yoshio Yoshioka, Osaka, Hisashi Aoki, Suita, and Jun Toda, Nishinomiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**No Drawing. Filed June 26, 1968, Ser. No. 740,094**
**Claims priority, application Japan, June 26, 1967, 42/40,899**
**Int. Cl. C07d** *51/54*
**U.S. Cl. 260—211.5 R** **7 Claims**

The 2-(lower-alkoxy)inosine-5'-phosphates (2-methoxy-, 2-ethoxy-, 2-n-propoxy- and 2-isopropoxy-inosine-5'-phosphates) have a high capacity for improving the flavor of foods and beverages. Moreover, there is a significant synergistic action therebetween and monosodium glutamate.

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3,644,332
**PREPARATION OF GRANULAR STARCH DERIVATIVES**

**Robert A. Mooth, Tinley Park, and Stanley F. Ciesla, Brookfield, Ill., and Hugh J. Roberts, Wauwatosa, Wis., assignors to CPC International Inc.**

**No Drawing. Filed Sept. 5, 1968, Ser. No. 757,761**
**Int. Cl. C08b** *19/01*
**U.S. Cl. 260—233.3** **1 Claim**

Derivatives of starch heretofore unattainable by aqueous reaction techniques as well as increased efficiency of attainable derivative formulations by aqueous reaction techniques are achieved by reacting a hydrophobic reagent with a granular starch in a three phase system comprised of (1) granular starch (2) water, and (3) a hydrophobic reagent which is emulsified in the continuous aqueous phase by an emulsifier.

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3,644,333
**TRANSESTERIFICATION IN THE PRESENCE OF A TRANSPARENT EMULSION**

**Lloyd I. Osipow, New York, and William Rosenblatt, Spring Valley, N.Y., assignors to the State of Nebraska, Lincoln, Nebr.**

**No Drawing. Filed Jan. 28, 1969; Ser. No. 794,793**
**Int. Cl. C07c** *69/32*
**U.S. Cl. 260—234 R** **5 Claim**

An improved process for synthesizing organic compounds is provided in which a reaction is conducted between immiscible reactants, the process comprises combining the immiscible reactants in the presence of water and suitable emulsifying agents to form a transparent emulsion, and carrying out a reaction between said immiscible reactants to form a reaction product. The improvement also provides a process in which water is distilled from the transparent emulsion to form a microdisperison, and a reaction is carried out between two immiscible reactants, one of which is in the form of very fine solid particles dispersed in a liquid medium. Furthermore, an improved process of preparing sucrose esters is provided which comprises employing water as the solvent for the sucrose component in a transparent emulsion, distilling off the water to form a microdispersion of sucrose, and reacting the solid sucrose particles to form sucrose esters of fatty acids.

3,644,334
**7-AZIDO-BENZODIAZEPINES**

**Robert Ye-Fong Ning, West Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Filed Feb. 12, 1970, Ser. No. 11,022**
**Int. Cl. C07d** *53/06*
**U.S. Cl. 260—239 BD** **14 Claims**

7-azido-benzodiazepines and processes for preparing the foregoing. Such 7-azido-benzodiazepines are useful as anticonvulsants, muscle relaxants and sedative agents.

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3,644,335
**PREPARATION OF AMIDINES FROM AMIDES**

**James Valentine Earley, Cedar Grove, Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 621,434, Mar. 8, 1967. This application May 7, 1968, Ser. No. 727,339**
**Int. Cl. C07d** *53/06*
**U.S. Cl. 260—239 BD** **8 Claims**

Amides are converted to their corresponding amidines by reacting the amides with an amino compound in the presence of a non-aqueous acid reagent, e.g., p-toluenesulfonic acid or titanium tetrachloride. This procedure is applicable to primary and secondary amines. In a specific embodiment 1,4-benzodiazepin-2-ones are directly converted into 2-amino-1,4-benzodiazepines.

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3,644,336
**2,3-DIHYDRO - 4 - HYDROXY-5-PHENYL-1H-1,4-BENZODIAZEPINES AND PREPARATION THEREOF**

**Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Application June 19, 1967, Ser. No. 647,226, now Patent No. 3,498,973, dated Mar. 3, 1970, which is a division of application Ser. No. 267,908, Mar. 25, 1963. Divided and this application Dec. 5, 1969, Ser. No. 882,744**
**Int. Cl. C07d** *53/06*
**U.S. Cl. 260—239 BD** **3 Claims**

Novel 2,3-dihydro-4-hydroxy-5-phenyl-1H-1,4-benzodiazepines and preparation thereof prepared via reduction of 2,3-dihydro-5-phenyl-1H-1 4-benzodiazepine 4-oxides, are described. These novel products are useful as anticonvulsant agents.

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3,644,337
**PROCESS FOR THE MANUFACTURE OF 3-FORMYLRIFAMYCIN-SV**

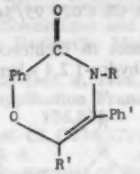
**Hans Bickel and Bruno Fechtig, Binningen, and Wilhelm Kump, Therwil, Switzerland, assignors to Ciba Corporation, New York, N.Y.**

**No Drawing. Filed June 4, 1968, Ser. No. 734,199**
**Claims priority, application Switzerland, June 16, 1967, 8,583/67**
**Int. Cl. C07d** *87/54*
**U.S. Cl. 260—239.3** **22 Claims**

A new process for preparing 3-formylrifamycin-SV from 3-aminomethyl-rifamycin S compounds without the use of an oxidant is based on a finding that 3-aminomethyl-rifamycin-S compounds whose amino group in position 3 is derived from a secondary amine is split by acids in the presence of water to give 3-formylrifamycin-SV and the amine corresponding to the amino group in position 3 of the starting material used. The said 3-aminomethylrifamycin S compounds probably react in the presence of acid in a tautomeric form which by addition of acid gives amine derivatives of 3-formyl-rifamycin-SV; the latter split hydrolytically into 3-formylrifamycin SV and an amine.

3,644,338
**4-AMINOALKYL-3-ARYL-1,4-BENZOXAZEPIN-5(4H)-ONES**
Karl Schenker, Binningen, Switzerland, assignor to Ciba Corporation, Summit, N.J.
No Drawing. Filed Mar. 11, 1969, Ser. No. 806,300
Claims priority, application Switzerland, Mar. 21, 1968, 4,171/68; Feb. 19, 1969, 2,508/69
Int. Cl. C07d *87/54*
U.S. Cl. 260—239.3 9 Claims

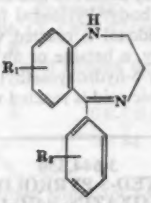
4-aminoalkyl - 3 - aryl-1,4-benzoxazepin-5(4H)-ones of the formula



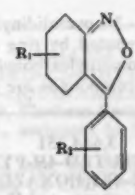
in which Ph represents an optionally substituted o-phenylene radical, Ph' an optionally substituted aryl radical, R an aminoalkyl radical disubstituted at the amino nitrogen atom, in which the amino nitrogen atom is separated from the cyclic nitrogen atom by at least 2 carbon atoms, and R' stands for a hydrogen atom or an alkyl group are useful as antiphlogistics and as mild analgesics.

3,644,339
**PROCESS FOR THE PRODUCTION OF BENZODIAZEPINE DERIVATIVES**
Toru Masuda, Nishinomiya, Yoshiro Usui, Ibaraki, Yukio Hara, Kawanishi, and Toshikatsu Komatsu, Nishinomiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed July 14, 1969, Ser. No. 841,611
Claims priority, application Japan, July 17, 1968, 43/50,306
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 6 Claims

Process for producing benzodiazepine compounds of the formula



in which $R_1$ and $R_2$ are hydrogen, halogen or nitro, which involves reacting an anthranyl compound of the formula



(1)

wherein $R_1$ and $R_2$ have the significances above with (2) an acid salt of glycine ester, said reaction being carried in the presence of an organic base under heating. The finally produced benzodiazepine compounds have excellent pharmacological properties and may specifically be used as sedative agents.

3,644,340
**PREPARATION OF 21-CHLORO STEROIDS**
Belig M. Berkoz, Los Altos Hills, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Mar. 19, 1970, Ser. No. 21,215
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 7 Claims

A process for preparing 21-chloro steroids which involves the step of treating a 21-hydroxy steroid with triphenylphosphine and carbon tetrachloride in dipolar aprotic reaction media. The 21-chloro steroid products are known, useful anti-inflammatory agents.

3,644,341
**6-GEM-DIFLUORO PREGNANES**
John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Mar. 3, 1969, Ser. No. 803,955
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 24 Claims

6α,6β-difluoropregn-4-en-3-ones; optionally substituted at C–1,2-with methylene, at C–21 with fluoro or chloro; at C–16 with hydroxy, methyl or methylene, at C–17 with hydroxy or the esters thereof, or C–16 and C–17 are bridged by a cyclic acetal or ketal, optionally there is a double bond between C–1,2; exhibit progestational activity.

3,644,342
**OZONOLYSIS OF 2-HYDROXY-3-OXO-$\Delta^{1,4}$ STEROIDS**
Robert J. Chorvat, Raphael Pappo, and Mike G. Scaros, Arlington Heights, Ill., assignors to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed May 5, 1969, Ser. No. 821,948
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 9 Claims

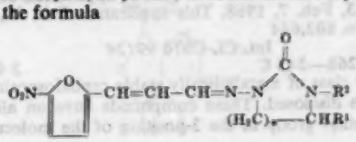
Ozonolysis of 2-hydroxy-3-oxo-$\Delta^{1,4}$ steroids results in A-nor-1,2-seco aldehydo acids, which intermediates are useful in the manufacture of pharmacologically active 2-oxa-3-oxo-$\Delta^4$ steroids.

3,644,343
**PHENYL AND SUBSTITUTED PHENYLSULFONYLALLYL AMINES AND SUBSTITUTED AMINES**
Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Mar. 16, 1970, Ser. No. 20,110
Int. Cl. C07d *87/46*
U.S. Cl. 260—240 R 7 Claims

Phenyl and substituted phenylsulfonylallyl amines and substituted amines, e.g., 1-(3 - phenylsulfonylallyl)-pyrrolidine hydrochloride, are prepared by treating a phenyl or substituted phenylsulfonyl-2-propen-1-ol with an amine or substituted amine, treating the resulting intermediate with $SOCl_2$ and then with sodium carbonate and allowing the resulting intermediate to rearrange to the final product. The compounds are useful as anti-inflammatory agents

3,644,344
**NITROFURYLACRYLIDENE DERIVATIVES**
Max J. Mousseron, Montpellier, Herault, France, assignor to Etablissements Clin-Byla, Paris, France
No Drawing. Filed July 2, 1969, Ser. No. 838,656
Claims priority, application France, July 5, 1968, 158,054
Int. Cl. C07d *49/30, 51/42*
U.S. Cl. 260—240 A 3 Claims

(5-nitrofuryl-2)acrylidene derivatives of a cyclic urea having the formula



in which $n$ is 1 or 2, $R^1$ is hydrogen or lower alkyl and $R^2$ is hydrogen or a carbamoyl group of the formula —C:O—NHA in which A is alkyl, alkenyl, aryl, haloaryl, polyhaloaryl, acyl, haloacyl, polyhaloacyl, aroyl, haloaroyl or polyhaloaroyl, have pharmacological properties which render them useful in combatting staphylococci, streptococci and in salmonellosis.

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3,644,345

## BENZOXAZOLYL-1,3,4-OXDIAZOLE DERIVATIVES

**Adolf Emil Siegrist, Basel, Peter Liechti, Binningen, Erwin Maeder, Aesch, and Leonardo Guglielmetti, Birsfelden, Switzerland, assignors to Ciba Limited, Basel, Switzerland**

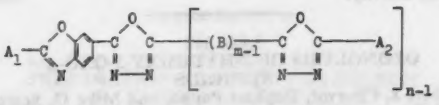
**No Drawing. Continuation-in-part of application Ser. No. 798,258, Feb. 3, 1969, which is a continuation of application Ser. No. 548,413, May 9, 1966. This application July 18, 1969, Ser. No. 843,199**

**Claims priority, application Switzerland, May 10, 1965, 6,472/65**

**Int. Cl. C09d** *23/16;* **C07d** *85/48, 31/40*

**U.S. Cl. 260—240 CA** **13 Claims**

New benzoxazolyl-1,3,4-oxdiazole compounds are provided which may be represented by the formula



wherein $A_1$ and $A_2$ are identical and each represents phenyl, diphenylyl, naphthyl, styryl, stilbenyl, benzoxazolylphenyl, 1,3,4 - oxdiazolylphenyl, 6 - benzoxazolyl, thienyl, pyridyl, phenylthienyl, benzoxazolylthienyl, phenylbenzoxazolyl or 1,3,4-oxdiazolylthienyl residue; B represents 1,4-phenylene, 2,5-furoylene or 2,5-thienylene, and $m$ and $n$ each is 1 or 2. The benzoxazolyl-1,3,4-oxdiazole compounds of this invention may be further substituted by non-chromophoric, monovalent substituents.

The compounds of the present invention are especially valuable as optical brighteners for organic materials.

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3,644,346

## DIBENZOXAZEPINE SEMICARBAZONES

**John W. Cusic, Skokie, Ill., and William E. Coyne, St. Paul, Minn., assignors to G. D. Searle & Co., Chicago, Ill.**

**No Drawing. Filed Oct. 27, 1969, Ser. No. 869,885**

**Int. Cl. C07d** *87/54, 93/42*

**U.S. Cl. 260—240 G** **4 Claims**

Semicarbazones of dibenzoxazepine-N-carboxylic acid hydrazides and related compounds are described herein. The compounds are useful as anti-ulcer agents, anti-protozoal agents, and anti-algal agents. They are prepared by the reaction of the appropriate aldehyde with a semicarbazide.

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3,644,347

## 3-AMINOMETHYL CEPHALOSPORIN COMPOUNDS

**J. Alan Webber and Earle M. van Heyningen, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**No Drawing. Continuation-in-part of application Ser. No. 703,523, Feb. 7, 1968. This application Feb. 26, 1969, Ser. No. 802,644**

**Int. Cl. C07d** *99/24*

**U.S. Cl. 260—243 C** **3 Claims**

A new class of metabolically stable cephalosporin compounds is disclosed. These compounds have an aliphatic aminomethyl group in the 3-position of the molecule.

3,644,348

## PROCESS FOR THE PREPARATION OF 6-CHLORO-7-SULFAMYL, 3-POSITION SUBSTITUTED-3,4-DIHYDRO-1,2,4-BENZOTHIADIAZINE-1,1-DIOXIDE

**Tsutomu Irikura, 72 Shimura Nakadaimachi, Itabashi-ku, Tokyo, Japan, and Seigo Suzue, 97, 1-chome, Kohan, Okaya-shi, Nagamo-ken, Japan**

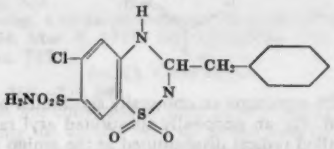
**Continuation of application Ser. No. 574,371, Aug. 23, 1966, which is a continuation-in-part of application Ser. No. 100,512, Apr. 4, 1961. This application Apr. 25, 1969, Ser. No. 820,701**

**Claims priority, application Japan, Mar. 4, 1961, 36/7,520; Mar. 6, 1961, 36/7,636**

**Int. Cl. C07d** *93/34*

**U.S. Cl. 260—243 D** **5 Claims**

This invention relates to 6-chloro-7-sulfamyl, 3-position substituted-3,4-dihydro-1,2,4 - benzothiadiazine - 1,1-dioxide of



The compound exhibits remarkable diuretic and blood pressure lowering effects. The invention also relates to processes of preparing the above compound.

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3,644,349

## NOVEL VITAMIN $B_6$ DERIVATIVE AND THE PREPARATION THEREOF

**Kentaro Okumura and Ichizo Inoue, Hyogo-ken, Tatsuo Oda, Osaka-shi, and Kazuhiko Kondo, Higashi-Osaka-shi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

**No Drawing. Filed July 10, 1969, Ser. No. 840,849**

**Claims priority, application Japan, July 19, 1968, 43/51,043**

**Int. Cl. C07d** *93/06*

**U.S. Cl. 260—243 R** **4 Claims**

N-[2-(3-hydroxy - 5 - hydroxymethyl - 2 - methyl-4-pyridyl) - tetrahydro-1,3-thiazine-4-carbonyl]glycine and its pharmaceutically acceptable acid addition salts. These compounds are readily absorbed and afford prolonged pyridoxal levels in the body. Pyridoxal free base or an acid addition salt of pyridoxal is reacted with homocysteinylglycine. Alternatively, a betaine or an alkali metal salt of (2-methyl-3-hydroxy-5-hydroxymethyl - 4 - pyridyl)-hydroxymethane-sulfonic acid is reacted with homocysteinylglycine.

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3,644,350

## 4-(1-SUBSTITUTED-3-PYRROLIDINYL)-2H-1,4-BENZOXAZIN-3(4H)-ONES

**Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.**

**No Drawing. Filed July 7, 1969, Ser. No. 839,658**

**Int. Cl. C07d** *87/48*

**U.S. Cl. 260—244 R** **5 Claims**

4 - [1 - substituted - 3 - pyrrolidinyl] - 2H - 1,4 - benzoxazin-3(4H)-ones prepared by ring closure of 1-substituted - 3 - (N - chloromethylcarbonyl) - o - hydroxyanilinopyrrolidines. The compounds are analgetics.

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3,644,351

## 2-ALKYL-7-SUBSTITUTED-4*H*-PYRIMIDO[5',4':4,5]THIENO[3,2-*d*][1,3]OXAZIN-4-ONES

**Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.**

**No Drawing. Filed Nov. 4, 1969, Ser. No. 874,050**

**Int. Cl. C07d** *87/20*

**U.S. Cl. 260—244 R** **5 Claims**

This invention concerns 2 - alkyl - 7 - substituted-4*H*-pyrimido[5',4':4,5]thieno[3,2-*d*][1,3]oxazin - 4 - ones

which are useful intermediates in the preparation of 2-alkyl - 3,7 - disubstituted thieno[2,3-*d*:4,5-*d'*]dipyrimidin-4(3*H*) - ones which are pharmacologically active as central nervous system depressants. Further this invention is also concerned with a process for preparation of these intermediate compounds by the reaction of a 5 - amino-2-substituted thieno[2,3-*d*]pyrimidine-6-carboxanilide with a carboxylic acid anhydride.

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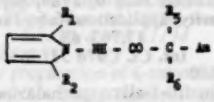
3,644,352
**N-α-AMINO ACYLAMIDO PYRROLES**

**Richard Rips, Paris, France, assignor to Centre National de la Recherche Scientifique and Institut National de la Sante et de la Recherche Medical, both of Paris, France**

**No Drawing. Filed Dec. 4, 1968, Ser. No. 781,241**
**Claims priority, application France, Nov. 20, 1968, 176,071**
**Int. Cl. C07d *27/26***
**U.S. Cl. 260—247.2 A** **5 Claims**

N-α-amino acylamido pyrroles of the formula:



in which
$R_1$ and $R_2$ are each cyclic or acyclic hydrocarbon radicals
Am is a cyclic or acyclic secondary amine radical linked by its nitrogen atom to the α-carbon atom of the acyl group,
$R_5$ and $R_6$ are each hydrogen or methyl,
and their salts are useful in treating disorders of the central nervous system, the cardiovascular system and the endocrine system.

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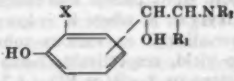
3,644,353
**4, HYDROXY-α'AMINOMETHYL-m-XYLENE-α',α³-DIOLS**

**Lawrence H. C. Lunts and Paul Toon, London, England, assignors to Allen and Hanburys Limited, London, England**

**No Drawing. Filed Sept. 20, 1967, Ser. No. 669,263**
**Claims priority, application Great Britain, Sept. 23, 1966, 42,590/66**
**Int. Cl. C07d *87/40***
**U.S. Cl. 260—247.5 R** **10 Claims**

Novel 1-phenyl-2-amino ethanol derivatives of the formula:



are disclosed. Some have stimulant action and some have blocking action on β-adrenergic receptors. α¹-tert.-butylaminomethyl-4-hydroxy-m-xylene α¹,α³-diol has a particularly marked stimulant action. Pharmaceutical compositions are also disclosed of which aerosols are particularly effective.

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3,644,354
**5-SUBSTITUTED-2,3-DIHYDROIMIDAZO [1,2-c]QUINAZOLINES**

**Goetz E. Hardtmann, Florham Park, and Hans Ott, Convent Station, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.**

**No Drawing. Filed Sept. 16, 1968, Ser. No. 760,054**
**Int. Cl. C07l *57/12***
**U.S. Cl. 260—247.5 R** **31 Claims**

The invention discloses 5-N-substituted-2,3-dihydroimidazo[1,2-c]quinazolines, e.g., 5-diallylamino-8,9-dimethoxy-2,3-dihydroimidazo[1,2-c]quinazoline, which are pharmaceutically active and useful, for example, as hypotensive agents and as coronary dilators. Also disclosed are processes involved in preparation of said 2,3-dihydroimidazo[1,2-c]quinazolines employing intermediates which are 5-chloro-2,3-dihydroimidazo[1,2-c]quinazolines and 2-chloro-4-ethylenimino-quinazolines.

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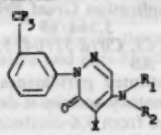
3,644,355
**PYRIDAZONE DERIVATIVES**

**Cuno Ebner, Reinach, and Max Schuler, Arlesheim, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland**

**No Drawing. Continuation-in-part of application Ser. No. 691,249, Dec. 18, 1967. This application Dec. 4, 1969, Ser. No. 882,294**
**Int. Cl. C07d *51/04***
**U.S. Cl. 260—250 A** **7 Claims**

Compounds of formula:



in which X signifies chlorine or bromine, $R_1$ signifies hydrogen or methyl and $R_2$ signifies methyl or, when $R_1$ signifies hydrogen, $R_2$ may also signify ethyl, are disclosed as possessing selective herbicidal activity in cotton and carrots.

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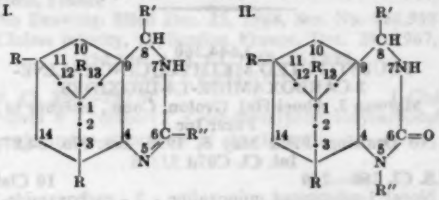
3,644,356
**ADAMANTANOPYRIMIDINE COMPOUNDS AND INTERMEDIATES THEREFOR**

**Jiban Kumar Chakrabarti, Frimley, and Stephen Slomo Szinai, Wokingham, England, assignors to Eli Lilly and Company, Indianapolis, Ind.**

**No Drawing. Filed May 1, 1969, Ser. No. 821,063**
**Claims priority, application Great Britain, May 21, 1968, 24,224/68**
**Int. Cl. C07d *51/46***
**U.S. Cl. 260—251 A** **4 Claims**

Adamantanopyrimidine compounds of the formulae:



useful as analgesics and as local anaesthetics; and intermediates useful in the synthesis of the foregoing adamantanopyrimidino compounds. In the above formulae each R represents hydrogen or $C_1$–$C_3$ loweralkyl, the sum of the number of carbon atoms in all three R groups being not greater than 6; each R' independently represents hydrogen or straight-chain $C_1$–$C_6$ alkyl; and each R'' independently represents hydrogen or $C_1$–$C_3$ loweralkyl.

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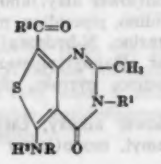
3,644,357
**DERIVATIVES OF THIENO[3,4-α]PYRIMIDINE AND PREPARATION THEREOF**

**Real Laliberte, Laval, Quebec, Canada, assignor to Ayerst, McKenna and Harrison Limited, St. Laurent, Quebec, Canada**

**No Drawing. Filed Feb. 27, 1969, Ser. No. 803,083**
**Int. Cl. C07d *99/06***
**U.S. Cl. 260—256.5 R** **5 Claims**

5 - aminothieno[3,4-d]pyrimidin - 4(3H) - one derivatives of Formula I,



in which $R^1$ represents a lower alkyl group containing from one to two carbon atoms, a dimethylamino group or a piperidino group; $R^2$ represents a lower alkyl group containing from one to two carbon atoms, a phenyl group or a 3-nitrophenyl group; and $R^3$ represents a methyl group, a phenyl group, or a 4-biphenylyl group.

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3,644,358

## ANTI-INFLAMMATORY 1,2,4-TRIAZINES

Patrick Roffey, Camberley, and John Pomfret Verge, Henley-on-Thames, England, assignors to Lilly Industries, Ltd., London, England

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,934
Claims priority, application Great Britain, Jan. 21, 1969, 3,364/69
Int. Cl. C07d *51/04, 55/10*
U.S. Cl. 260—248 AS 3 Claims

A series of substituted pyridazines and 1,2,4-triazines having anti-inflammatory activity is described. These compounds are prepared from 3,6-disubstituted-s-tetrazines by treatment with a cyclic enol ether, an acetylenic amine, an acetylenic ether, a cyclic enol ester, or an imino ether.

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3,644,359

## FREE-FLOWING CYANURIC ACIDS

Raymond N. Mesiah, Somerset, N.J., and Harold R. Chancey, Charleston, W. Va., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed May 1, 1970, Ser. No. 33,911
Int. Cl. C07d *55/36*
U.S. Cl. 260—248 A 5 Claims

Cyanuric acid which has been purified by acid digestion is not free-flowing, and it cakes upon storage. This invention provides a method of making the acid-digested cyanuric acid free-flowing and non-caking.

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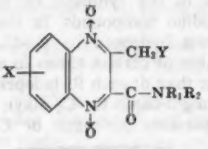
3,644,360

## 3-SUBSTITUTED METHYLQUINOXALINE-2-CARBOXAMIDE-1,4-DIOXIDES

Marwan J. Abuel-Haj, Groton, Conn., assignor to Pfizer Inc.

No Drawing. Filed May 5, 1970, Ser. No. 34,871
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 10 Claims

Novel 3-substituted quinoxaline - 2 - carboxamide-1,4-dioxides having the formula



wherein

X is a 6- or 7-position substituent and is hydrogen, methyl, methoxy, bromo, chloro, fluoro and trifluoromethyl;

Y is lower alkylthio, lower alkyl sulfinyl and lower alkyl sulfonyl;

$R_1$ is hydrogen and lower alkyl; and

$R_2$ is hydrogen, lower alkyl and substituted lower alkyl wherein the substituent is

(a) amino, mono(lower alkyl)amino, di(lower alkyl) amino, pyrrolidino, piperidino, morpholino, N-(lower alkyl)piperazino, N-hydroxy(lower alkyl)piperazino, N-(lower alkanoyl)piperazino, N-carbo(lower alkoxy)-piperazino, pyrrolo, piperazino, imidazoli dino,

(b) hydroxy, lower alkoxy, carboxy, carbo(lower) alkoxy, carbamyl, mono(lower alkyl)carbamyl, di(lower alkyl)carbamyl, lower alkanoyloxy, lower alkanoylamino; and

$R_1$ and $R_2$ when taken together with the nitrogen to which they are attached are pyrrolo, pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, N-(lower alkyl)piperazino, N-hydroxy(lower alkyl) piperazino, N-(lower alkanoyl)piperazino and N-carbo(lower alkoxy)piperazino;

and the pharmaceutically-acceptable acid addition salts of those compounds wherein $R_2$ is substituted lower alkyl wherein the substituent is selected from group (a); methods for their preparation; and their use as antibacterial agents and as agents for promoting growth and improving feed efficiency of animals.

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3,644,361

## PHTHALAZINES

Elvio Bellasio, Albate, Italy, Emilio Testa, Ticino, Switzerland, and Giulio Maffii, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed June 9, 1969, Ser. No. 831,707
Claims priority, application Italy, June 12, 1968, 17,703/68
Int. Cl. C07d *51/06*
U.S. Cl. 260—250 24 Claims

Novel 3,4-dihydro-1-alkoxyphthalazines are prepared by the reaction of the corresponding 3,4-dihydro-1(2H)-phthalazinones with a trialkyloxonium fluoborate. The novel compounds are useful sedative hypnotic and anticonvulsant agents.

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3,644,362

## 1,2-DIAZABICYCLO[2.2.2]OCTANES

Philip M. Carabateas, Shodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 411,706, Nov. 17, 1964, which is a continuation-in-part of application Ser. No. 236,705, Nov. 9, 1962. This application June 30, 1969, Ser. No. 837,953
Int. Cl. C07d *51/02*
U.S. Cl. 260—250 A 25 Claims

Novel 1,2-diazabicyclo[2.2.2]octanes are prepared by intra-molecularly cyclizing a 1-aminopiperidine compound containing in the 4-position a substituent capable of reacting with the 1-amino group to form either one or two carbon-to-nitrogen bonds, for example, cyclizing a 1-amino-4-Y-[C(=O)B]-piperidine, where Y is H, Ar-lower-alkyl or Ar where Ar is phenyl and related groups, and B is O-(lower-alkyl) or R′ where R′ is lower-alkyl, lower-cycloalkyl, lower-alkenyl or various substituted lower-alkyl groups to yield, respectively, 3-oxo-4-Y-1,2-diazabicyclo[2.2.2]octane or 3 - B(or R′) - 1,2 - diazabicyclo [2.2.2]octane which is used to prepare various 2-substituted-1,2-diazabicyclo[2.2.2]octanes or other 3-substituted-1,2-diazabicyclo[2.2.2]octanes. The 1,2-diazabicyclo [2.2.2]octanes are useful antitussive agents.

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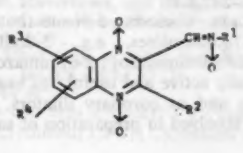
3,644,363

## 1,4-DIOXIDOQUINOXALINYL NITRONES

Hyun Koo Kim, Ashland, Ohio, assignor to Richardson-Merrell Inc., New York, N.Y.

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,796
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 4 Claims

1,4-dioxidoquinoxalinyl nitrones having the formula



in which $R^1$ is an alkyl radical of 1 to 10 carbon atoms of straight, branched chain or cyclic configuration which may be substituted with hydroxy, dihydroxy, alkoxy, acyloxy, halogen, or trihalo groups; or $R^1$ may be a phenyl radical or a phenyl radical substituted with a lower alkyl group of 1 to 4 carbon atoms or a halogen; $R^2$ is hydrogen, lower alkyl of 1 to 4 carbon atoms, and $R^3$ and $R^4$ are chosen from the group consisting of hydrogen, alkoxy or alkyl of 1 to 4 carbon atoms, halogen, trihalomethyl, or nitro groups. These new compounds, which are potent antibacterial agents, are effective orally, topically and parenterally in low concentrations in inhibiting the growth of both gram-negative and gram-positive bacteria. The compounds may be made by reacting an appropriate 2-formylquinoxaline 1,4-dioxide with an N-substituted hydroxylamine.

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3,644,364

## COMPOUNDS AND PROCESS

William Crawford Anthony, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 31, 1970, Ser. No. 24,351
Int. Cl. C07d *51/34*
U.S. Cl. 260—256.4 H 3 Claims

Process for the preparation of 6-substituted-4-amino-1,2-dihydro-1-hydroxy-2-iminopyrimidines and 6-substituted-4-halo-1,2-dihydro-1-hydroxy-2-iminopyrimidines utilized as intermediates in said process. The 6-substituted-4-amino-1,2-dihydro-1-hydroxy-2-iminopyrimidines prepared by said process are useful as antihypertensive agents.

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3,644,365

## CERTAIN BIS(α-AMINOPROPYL)HYDROURACILS

Juergen Habermeier, Allschwil, Daniel Porret, Binningen, and Wolfgang Seiz, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Dec. 1, 1969, Ser. No. 881,267
Claims priority, application Switzerland, Dec. 3, 1968, 18,012/68; Jan. 10, 1969, 310/69
Int. Cl. C07d *51/34*
U.S. Cl. 260—256.4 C 4 Claims

New di-N,N'-γ-aminopropyl-dihydrouracils, for example 1,3-di-(γ-aminopropyl)-5,5-dimethyl-5,6-dihydrouracil, and their use as curing agents in curable moulding, coating and adhesive compositions which contain a polyepoxide compound, for example a liquid polyglycidyl ether of bisphenol A. Curing can be carried out at relatively low temperatures, for example at 40° C. The new type of curing agent bridges, in respect of its gradation of reactivity, a gap between aliphatic polyamines and cycloaliphatic polyamines. The new curing agents furthermore have the advantage relative to the aromatic polyamines of being non-toxic.

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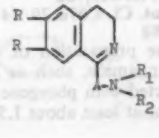
3,644,366

## 1-AMINO-3,4-DIHYDROISOQUINOLINES

Claude Jeanmart, Brunoy, Mayer Naoum Messer, Bievres, and Pierre Edouard Simon, Boulogne, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Mar. 5, 1969, Ser. No. 804,672
Claims priority, application France, Mar. 6, 1968, 142,607; Jan. 20, 1969, 6900907
Int. Cl. C07d *35/14*
U.S. Cl. 260—286 R 8 Claims

The 3,4-dihydroisoquinoline derivatives of the formula:



wherein the symbols R represent hydrogen, halogen or methoxy or together form a methylenedioxy group, A represents a single bond or a grouping



linked by the sulphur atom to the isoquinoline nucleus and $A_1$ represents an alkylene group of 1 through 5 carbon atoms, and $R_1$ and $R_2$ represent hydrogen, alkyl, halogenoalkyl, hydroxyalkyl, cyanoalkyl, dialkylaminoalkyl, 4-methyl-1-piperazinylalkyl, aralkyl, amino, thioureido, or a C-linked nitrogen-containing 5- or 6-membered mononuclear heterocyclyl group, or $R_1$ and $R_2$ together with the nitrogen atom to which they are attached collectively represent a 5- or 6-membered mononuclear heterocyclic group, are useful as therapeutics, possessing in particular anti-tussive and anti-fibrillating properties.

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3,644,367

## 17α-AZA-D-HOMOSTEROID[17,17a-e]TETRAZOLES

George Rosenkranz and Pierre Crabbé, Mexico City, Mexico, assignors to Syntex Corporation, Panama, Republic of Panama

No Drawing. Filed Apr. 30, 1968, Ser. No. 725,536
Int. Cl. C07d *10/00*
U.S. Cl. 260—287 R 6 Claims

17α-aza-D-homosteroid[17,17a-e]tetrazoles of the estrane and androstane series exhibit estrogenic or anabolic activity.

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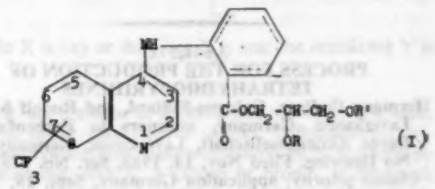
3,644,368

## NOVEL QUINOLINES

André Allais, Les Lilas, and Jean Meier, Coeuilly-Champigny, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,398
Claims priority, application France, Dec. 29, 1967, 134,404; Aug. 23, 1968, 163,980
Int. Cl. C07d *33/52*
U.S. Cl. 260—287 R 1 Claim

Novel 4 - [ortho-(2',3'-dihydroxypropyloxycarbonyl)-phenyl]-amino-quinolines of the formula



(I)

wherein the $CF_3$ radical is in the 7 or 8-position, R and R' are hydrogen and taken together form a ketonide of the formula

P and Q being selected from the group consisting of alkyl aralkyl and aryl and the non-toxic, pharmaceutically acceptable addition salts when R and R' are hydrogen, which possess notable anti-inflammatory activity and intense analgesic activity.

3,644,369

## ISOINDOLO[1,2-a]ISOQUINOLINE-8-ONES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application Mar. 15, 1967, Ser. No. 623,239, now Patent No. 3,498,988, dated Mar. 3, 1970. Divided and this application Nov. 17, 1969, Ser. No. 877,432

Int. Cl. C07d *57/04*

U.S. Cl. 260—289 R 7 Claims

The compounds and certain intermediates are useful as central nervous system stimulants and anti-inflammatories. They are prepared by converting an isoindolo[1,2-a]isoquinoline to its quaternary ammonium salt by treatment with a lower alkyl halide, e.g. methyl iodide, and reducing the salt by sodium in liquid ammonia to cleave the bond common to the five membered ring of the isoindolo moiety and six membered ring to the isoquinolino moiety, thus forming the nine membered N-heterocyclic ring of dibenz[c,f]azonine. For example, 2,3-dimethoxy-7-methyl-5,6,7,8-tetrahydrodibenz[c,f]azonine can thus be prepared from 2,3-dimethoxy-5,6,8,12b-tetrahydroisoindolo[1,2-a]isoquinoline.

3,644,370

## ISOINDOLO[1,2-a]ISOQUINOLINES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application Mar. 15, 1967, Ser. No. 623,239, now Patent No. 3,498,988, dated Mar. 3, 1970. Divided and this application Nov. 17, 1969, Ser. No. 877,452

Int. Cl. C07d *57/04*

U.S. Cl. 260—289 R 8 Claims

The compounds and certain intermediates are useful as central nervous system stimulants and anti-inflammatories. They are prepared by converting an isoindolo[1,2-a]isoquinoline to its quaternary ammonium salt by treatment with a lower alkyl halide, e.g. methyl iodide, and reducing the salt by sodium in liquid ammonia to cleave the bond common to the five membered ring of the isoindolo moiety and six membered ring to the isoquinolino moiety, thus forming the nine membered N-heterocyclic ring of dibenz[c,f]azonine. For example, 2,3-dimethoxy-7-methyl-5,6,7,8-tetrahydrodibenz[c,f]azonine can thus be prepared from 2,3-dimethoxy-5,6,8,12b-tetrahydroisoindolo-[1,2-a]isoquinoline.

3,644,371

## PROCESS FOR THE PRODUCTION OF TETRAHYDROPYRIDINES

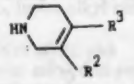
Hermann Oediger, Cologne-Flittard, and Rudolf Merten, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,899
Claims priority, application Germany, Sept. 18, 1967, F 54,331

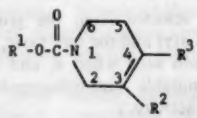
Int. Cl. C07d *29/38*

U.S. Cl. 260—290 H 1 Claim

Tetrahydropyridine of the formula



is produced by hydrolysing an N-carboalkoxytetrahydropyridine of the formula



in which $R^1$ represents a lower alkyl radical, and $R^2$ and $R^3$ each represents hydrogen or a lower alkyl radical, but do not simultaneously represent hydrogen, by heating the N-carboalkoxytetrahydropyridine at a temperature of from about 200° C. to 300° C. in a pressure-tight vessel with at least the stoichiometrically necessary quantity of a solid anhydrous alkali metal hydroxide or alkaline earth metal oxide in the absence both of water and of organic solvents.

3,644,372

## 1-(4-PIPERIDYL) INDENES

Vasken Paragamian, Dresher, Pa., assignor to McNeil Laboratories, Incorporated

No Drawing. Continuation-in-part of application Ser. No. 635,370, May 2, 1967, which is a continuation-in-part of application Ser. No. 422,390, Dec. 30, 1964. This application Jan. 14, 1970, Ser. No. 2,959

Int. Cl. C07d *29/18*

U.S. Cl. 260—293.56 7 Claims

The compounds are of the class of substituted indenes useful for their pharmacological properties as hypotensive agents.

3,644,373

## METHOD FOR THE PRODUCTION OF 3-SUBSTITUTED-1,2,3,4,5,6-HEXAHYDRO-6,11-DIMETHYL-8-HYDROXY-2,6-METHANO-3-BENZAZOCINES

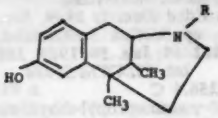
Kazuo Kigasawa, Kawasaki, and Mineharu Hiiragi, Nagatoshi Wagatsuma, and Osamu Kusama, Tokyo, Japan, assignors to Grelan Pharmaceutical Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 5, 1969, Ser. No. 882,734
Claims priority, application Japan, Dec. 6, 1968, 43/89,044

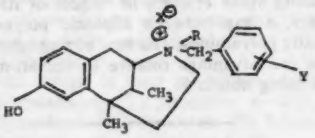
Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 14 Claims

A method for producing compounds of the formula



wherein R represents a member from the group of alkyl of up to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms and alkenyl of 2 to 10 carbon atoms, whereby a compound of the formula



is reacted with thiophenoxide anion.

3,644,374

## PROCESS FOR THE PREPARATION OF ACYLATED AMIDES

Raoul Buijle, 44 Dreve Pittoreque, Brussels 18, Belgium, and Heinz G. Viehe, 36 Avenue Schaveys, Beersel, Linkebeek, Belgium

No Drawing. Continuation-in-part of abandoned application Ser. No. 593,651, Nov. 14, 1966. This application Apr. 4, 1969, Ser. No. 813,755

Int. Cl. C07d *29/24*

U.S. Cl. 260—293.88 1 Claim

A process for the preparation of acylated amides is disclosed wherein an amide, such as N,N-dimethyl propionamide, is contacted with phosgene in a mole ratio of phosgene to amide of at least about 1.5 to 1. The acylated

amide is useful in the preparation of various heterocyclic compositions by ring closure of the amide with compounds having two active hydrogens, such as hydroxyl amines.

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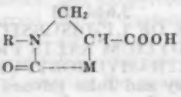
3,644,375

## LACTAM DICARBOXYLIC ACIDS AND PROCESS FOR PRODUCING THEM

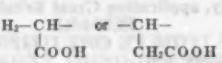
**Tsuneo Kobayashi and Kenichi Morita, Kanagawa, Hiroshi Kitagawa, Nagoya-shi, Aichi, Toshimitsu Yokoyama, Aichi, and Shigeo Makida, Kyoto, Japan, assignors to Toray Industries, Inc., Chuo-ku, Tokyo, Japan**

**No Drawing. Filed May 2, 1969, Ser. No. 821,493**
**Claims priority, application Japan, Oct. 18, 1968, 43/75,583**
**Int. Cl. C07d** *27/08, 29/22*
**U.S. Cl. 260—293.62** **26 Claims**

Lactam dicarboxylic acids represented by the general formula:



R represents a hydrogen atom or a hydrocarbon group having less than 20 carbon atoms. M represents either



Derivatives of the lactam dicarboxylic acid are also disclosed.

Process for preparing the diester or diamide of the above lactam dicarboxylic acid which comprises reacting 3-butene-1,2,3-tricarboxylic acid triester with ammonia or a primary amine having less than 20 carbon atoms is also disclosed.

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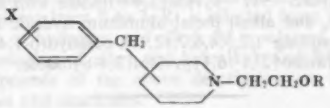
3,644,376

## 1-(β-HYDROXYETHOXY-ETHYL) - 4 - PARA-CHLOROBENZYLPIPERIDINE AND ITS LOWER ALKANOYL DERIVATIVES

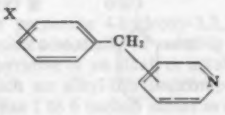
**Yasunobu Sato, Hiromu Takagi, Teruo Tanaka, and Katsuo Kamoshida, Tokyo, Japan, assignors to Sankyo Company Limited, Chuo-ku, Tokyo, Japan**

**No Drawing. Filed Apr. 10, 1969, Ser. No. 815,176**
**Claims priority, application Japan, Apr. 11, 1968, 43/24,167; Apr. 12, 1968, 43/24,389**
**Int. Cl. C07d** *27/24*
**U.S. Cl. 260—293.82** **3 Claims**

Novel benzylpiperidine derivatives having the formula



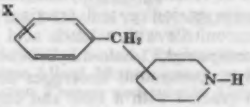
wherein X is a halogen atom, preferably chlorine atom, and R is a hydroxyalkyl group having 2 to 4 carbon atoms, preferably β-hydroxyethyl group, or an acyloxyalkyl group having 2 to 4 carbon atoms in the alkyl moiety, the acyl moiety of which may be an aliphatic acyl group having 2 to 5 carbon atoms or an aromatic acyl group having 6 or 10 carbon atoms in the aromatic ring, preferably β-acetoxyethyl group. These novel benzylpiperidine derivatives are useful as a non-narcotic antitussive agent and they are prepared by (A) reacting a benzylpyridine derivative having the formula



wherein X is as defined above with a substituted alkyl halide having the formula

$$XCH_2CH_2OR$$

wherein R and X are as defined above followed by subjecting the intermediate pyridinium salt to a catalyic reduction or (B) a benzylpiperidine derivative having the formula



wherein X is as defined above with the above-mentioned substituted alkyl halide.

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3,644,377

## PROCESS FOR THE PREPARATION OF (4-PYRIDYLTHIO)ACETIC ACID

**Chester Sapino, Jr., and Paul David Sleezer, Dewitt, N.Y., assignors to Bristol-Myers Company, New York, N.Y.**

**No Drawing. Filed Apr. 8, 1970, Ser. No. 26,753**
**Int. Cl. C07d** *31/50*
**U.S. Cl. 260—294.8 G** **5 Claims**

A new and more efficient process for the preparation of 4-(pyridylthio)acetic acid has been found which produces yields of approximately 70–95%. The process comprises treating a solution of 4-(1-pyridyl)pyridinium chloride with 2-mercaptoacetic acid preferably with the aid of heat. The compound, (4-pyridylthio)acetic acid is a valuable intermediate in the preparation of biologically active cephalosporins.

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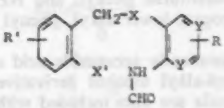
3,644,378

## PROCESS FOR PREPARING FORMAMIDES

**Harry Louis Yale, New Brunswick, and Jelka Pluscec, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.**

**No Drawing. Filed June 25, 1969, Ser. No. 836,654**
**Int. Cl. C07d** *31/50, 31/48*
**U.S. Cl. 260—294.8 F** **3 Claims**

An improved process for preparing compounds of the formula



wherein X is oxy or thio; one Y is aza; the remaining Y is

R and R′ are the same or different and represent hydrogen, halogen, lower alkyl, lower alkoxy, trifluromethyl, trifluoromethylmercapto, trifluoromethoxy or N,N-dimethylaminosulfonyl; and X′ is chloro or bromo, is disclosed. These compounds are useful in the preparation of dihydropyridobenzoxazepines and dihydropyridobenzothiazepines.

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3,644,379

## 2-AMINO-4,5,6,7-TETRAHYDRO - 4,7 - ETHANOTHIENO[2,3-b]PYRIDINES AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

**Ian Wellings, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Oct. 23, 1969, Ser. No. 868,898**
**Int. Cl. C07d** *31/50*
**U.S. Cl. 260—294.8 B** **7 Claims**

This invention relates to the discovery of a group of compounds herein described as 2-amino-4,5,6,7-tetrahydro-4,7-ethanothieno[2,3-b]pyridines which are effective topically against *Herpes simplex*/$H_4$/virus, *Herpes simplex*/2/ALA/SM virus and adenovirus-2.

3,644,380

## PREPARATION OF 3-CYANOPYRIDINE

Ronald Harmetz, Dover, and Roger J. Tull, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Nov. 24, 1969, Ser. No. 879,519
Int. Cl. C07d 31/46
U.S. Cl. 260—294.9 8 Claims

A process for preparing 3-cyanopyridine which comprises the steps of reacting 2-methyleneglutaronitrile with chlorine, bromine or iodine and reacting said 2-halo-2-halomethylglutaronitrile with a Lewis acid producing the intermediate compound, 3-halo-dihydro-3-cyano-pyridine wherein the latter compound undergoes dehydro-dehalogenation when reacted with a base and converted to the expected 3 - cyanopyridine(nicotinonitrile). The latter compound is a valuable intermediate for the production of niacin (nicotinic acid), the anti-pellagra B complex vitamin.

3,644,381

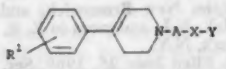
## CERTAIN 1 - [3-(LOWER-ALKYL OR PHENYL CARBAMOYLOXY)PROPYL]4 - PHENYL-1,2,3,6-TETRAHYDROPYRIDINES AND DERIVATIVES THEREOF

Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Original application Dec. 13, 1967, Ser. No. 690,097, now Patent No. 3,523,950, dated Aug. 11, 1970. Divided and this application Jan. 19, 1970, Ser. No. 4,129
Int. Cl. C07d 31/34
U.S. Cl. 260—295 CA 8 Claims

There are disclosed compositions of matter classified in the art of chemistry as derivatives of arylpyridinyl-alkyl alcohols as well as processes for making and using such compositions.

The novel chemical compounds are represented by the following formula:



wherein $R^1$ represents hydrogen, lower alkyl, lower alkoxy or trifluoromethyl; A represents alkylene having 2 to 4 carbon atoms; X represents —O—C(O)—; Y represents phenyl, substituted phenyl, and $NHR^2$ wherein $R^2$ represents hydrogen, lower alkyl, phenyl and substituted phenyl.

The pharmaceutically acceptable acid addition salts of the arylpyridinyl-alkyl alcohol derivatives embraced by the above formula are also included within the scope of this invention.

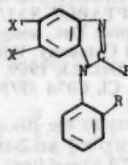
3,644,382

## BENZIMIDAZOLE DERIVATIVES OF BENZOIC ACID AND ITS ESTERS AND AMIDES

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, France, assignors to Roussel-UCLAF, Paris, France

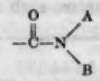
No Drawing. Filed Mar. 18, 1969, Ser. No. 808,298
Claims priority, application France, Mar. 20, 1968, 144,581, June 20, 1968, 155,808, 155,810
Int. Cl. C07d 49/38
U.S. Cl. 260—295 F 19 Claims

Benzimidazoles of the formula



(I)

wherein X and X′ may be different and are selected from the group consisting of hydrogen, halogen, alkyl, alkoxy, trihalomethyl and nitro, R is selected from the group consisting of —COOH, —COOR′, and



R′ is selected from the group consisting of aliphatic and hydroxylated residue of a glycol, A and B are selected from the group consisting of hydrogen and optionally substituted aliphatic and $R_1$ is selected from the group consisting of hydrogen, lower aliphatic hydrocarbon, unsubstituted and polysubstituted aryl, arylaliphatic, a thienyl, a β-pyridyl and a furyl with the proviso that when $R_1$ is phenyl, X′ and X are other than halogen, alkoxy and trifluoromethyl which compounds possess anti-inflammatory and antiviral activity and a novel process for their preparation.

3,644,383

## MANUFACTURE OF 1,1′-DISUBSTITUTED-4,4′- (OR -2,2′-) BIPYRIDYLIUM SALTS FROM 1,1′-DISUBSTITUTED TETRAHYDROBYPYRIDYLS

John Gerard Carey and John Edward Colchester, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,250
Claims priority, application Great Britain, May 29, 1968, 25,774/68
Int. Cl. C07d 31/42
U.S. Cl. 260—295 AM 12 Claims

A process for the manufacture of 1,1′-disubstituted-4,4′- (or -2,2′-) bipyridylium salts which comprises reacting the corresponding 1,1′-disubstituted tetrahydrobipyridyl with an inorganic oxyacid anhydride which is capable of accepting hydrogen ions and has a redox potential in water more positive than —1.48 volts as compared with the saturated calomel electrode.

3,644,384

## CERTAIN 2-(α-HALOACETYL) - 1,2,3,4-TETRAHYDRO - 9H - PYRIDO[3,4-b]INDOLE-3-CARBOXYLATES AND DERIVATIVES

John W. Schulenberg, Bethlehem, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.

No Drawing. Filed June 9, 1969, Ser. No. 831,750
Int. Cl. C07d 31/36
U.S. Cl. 260—295 C 3 Claims

New 1,2,3,4,6,7,12,12a-octahydro-2-phenylpyrazino[2′,1′:6,1]pyrido[3,4-b]indoles having useful pyschomotor stimulant properties are prepared by thermal cyclization of a 2-(α-halo-lower-alkanoyl)-3-carbo-lower-alkoxy-1,2,3,4-tetrahydro - 9H - pyrido[3,4-b]indole with an aniline derivative, and alkali metal aluminum hydride reduction of the resulting 1,2,3,4,6,7,12,12a-octahydro-1,4-dioxo-2-phenylpyrazino[2′,1′:6,1]pyrido[3,4-b]indole.

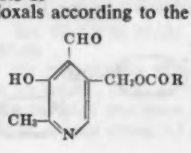
3,644,385

## α⁵-O-ACYL-PYRIDOXAL DERIVATIVES

Isamu Utsumi, Kyoto-shi, Kyoto-fu, Toshiro Watanabe, Takatsuki-shi, Osaka-fu, Keiichi Kohno, Toyonaka-shi, Osaka-fu, Isamu Daira, Kawanishi-shi, and Akira Otsubo, Kobe-shi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,793
Claims priority, application Japan, Nov. 27, 1967, 42/76,016
Int. Cl. C07d 31/34
U.S. Cl. 260—295.5 R 3 Claims

α⁵-O-acyl-pyridoxals according to the formula



and a method of manufacture thereof by oxidation of the corresponding $\alpha^5$-O-acyl-pyridoxine using manganese compounds as oxidizing agents.

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3,644,386
**2-AMINOALKYL PYRROL-3-YL KETONES**
**Irwin J. Pachter, 42 Juneau Blvd., Woodbury, N.Y. 11797, and Karl Schoen, 83-36 Beverly Road, Kew Gardens, N.Y. 11415**
**No Drawing. Application Sept. 1, 1967, Ser. No. 664,942, which is a continuation-in-part of application Ser. No. 575,303, Aug. 26, 1966, which in turn is a continuation-in-part of application Ser. No. 599,387, Dec. 6, 1966. Divided and this application July 15, 1968, Ser. No. 768,565**
**Int. Cl. C07d *27/26***
**U.S. Cl. 260—296** **4 Claims**

Process for preparing 2-aminoalkyl pyrrol-3-yl ketones and derivatives thereof, and oxopyrroles thus produced. The process is carried out by quaternizing 2-dimethylamino- or 2-piperidinyl-alkyl-pyrrol-3-yl ketones or derivatives thereof, particularly derivatives having bi- and tricyclic nuclei, and reacting the quaternary salts either with a base and an amine, or, alternatively, with an amine only.

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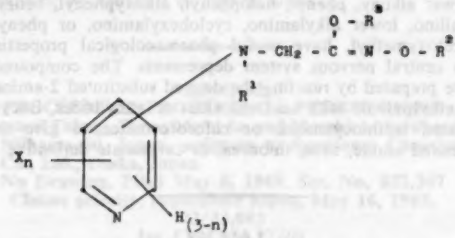
3,644,387
**CERTAIN SUBSTITUTED (PYRIDYLAMINO) 2-LOWER-ALKOXY IMINO-2-LOWER-ALKOXY ETHANES**
**Dietmar H. Olesch, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.**
**No Drawing. Filed Oct. 9, 1969, Ser. No. 865,172**
**Int. Cl. C07d *31/42***
**U.S. Cl. 260—296 R** **6 Claims**

This invention discloses compounds of the general formula



wherein X is selected from the group consisting of alkyl, alkenyl, alkoxy, alkylthio, nitro, haloalkyl and halogen; $n$ is an integer from 0 to 3; $R^1$ is selected from the group consisting of hydrogen and alkyl; $R^2$ is selected from the group consisting of alkyl and haloalkyl; and $R^3$ is alkyl. The compounds of the above description are useful as insecticides and acaricides.

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3,644,388
**PROCESS FOR MAKING 2,3,5-TRICHLORO-4-PYRIDINOL**
**Clive Dudley Spencer Tomlin, Maidenhead, and Anil Sunderji Mangalji, Loughborough, England, assignors to Imperial Chemical Industries Limited, London, England**
**No Drawing. Filed Feb. 16, 1970, Ser. No. 11,823**
**Claims priority, application Great Britain, Feb. 25, 1969, 9,954/69**
**Int. Cl. C07d *31/30***
**U.S. Cl. 260—297 R** **6 Claims**

A process for preparing 4-hydroxy-2,3,5-trichloropyridine, which consists essentially of reacting 4-hydroxy-2,3,5,6-tetrachloro pyridine or an alkali or alkaline earth metal salt thereof which an alkyl-lithium compound in which the alkyl group has 1 to 6 carbon atoms in a liquid diluent at a temperature of up to 20° C. and hydrolizing the resulting product. The compound produced by this process is commercially known as "pyriclor" an effective pre-emergence and post emergence herbicide against a variety of grasses and broadleaf herbs.

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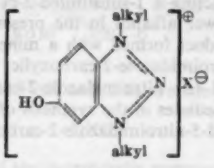
3,644,389
**6-HYDROXY-1,3-DIALKYL BENZOTRIAZOLIUM DERIVATIVES**
**Robert Frédéric Michel Sureau, Enghien-les-Bains, Marie-Josephe Jeanne Alicot, Montmorency, and Victor Marie Dupré, Louvres, France, assignors to Ugine Kuhlmann, Paris, France**
**No Drawing. Filed May 26, 1969, Ser. No. 827,964**
**Claims priority, application France, Dec. 9, 1965, 41,598**
**Int. Cl. C07d *55/04*; C07f *3/06*; C09b *29/36***
**U.S. Cl. 260—299** **4 Claims**

The present invention relates to new 6-hydroxy-1,3-dialkylbenzotriazolium salts of the following formula:



(I)

wherein $X^{\ominus}$ represents a monovalent anion and the alkyl groups in positions 1 and 3 are the same or different.

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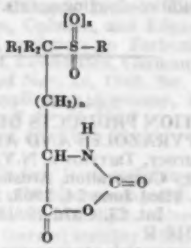
3,644,390
**2,5-OXAZOLIDINEDIONE DERIVATIVES OF S-OXIDIZED SULFUR-CONTAINING AMINO ACIDS**
**Raffaele Bernetti, Palos Park, and David W. Holty, Naperville, Ill., assignors to CPC International Inc.**
**No Drawing. Filed Dec. 17, 1968, Ser. No. 784,483**
**Int. Cl. C07d *85/34***
**U.S. Cl. 260—307** **3 Claims**

Amino acid derivatives represented by the following structural formula:



where R is selected from the group consisting of alkyl, aralkyl, aryl, and alkenyl groups, $R_1$ and $R_2$ are selected from the group consisting of hydrogen, alkyl, aralkyl, aryl and alkenyl groups, $n$ is a positive integer ranging from 0 to 5, and $x$ is either 0 or 1. Polypeptides prepared from the above amino acid derivatives are useful as temporary skin substitutes.

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3,644,391
**PROCESS FOR PREPARING 4(5)-NITRO-IMIDAZOLES**
**William A. Sklarz, Clark, Victor J. Grenda, Warren, Glenn W. Lindberg, Metuchen, and Albert D. Epstein, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**
**No Drawing. Filed Nov. 1, 1968, Ser. No. 772,839**
**Int. Cl. C07d *49/36***
**U.S. Cl. 260—309** **3 Claims**

Improved process for preparing 4(5)-nitroimidazoles by nitrating imidazole compounds using an anhydrous sul-

furic acid and nitric acid reaction medium containing an excess of free sulfur trioxide during the entire nitration.

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3,644,392
**1-SUBSTITUTED-5-NITROIMIDAZOLE-2-CARBOXIMIDATES**
David W. Henry, Menlo Park, Calif., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 654,290, May 22, 1967, which is a division of applications Ser. No. 300,675, Aug. 7, 1963, and Ser. No. 567,060, Sept. 12, 1967, now Patent No. 3,341,549. This application May 12, 1969, Ser. No. 823,991
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 7 Claims

1-substituted - 5 - nitroimidazole-2-carboximidates and 1-substituted - 5 - nitroimidazole-2-carboxylic acid esters are prepared from 2-substituted - 5 - nitroimidazoles by treating a 1-substituted-2-cyano - 5 - nitroimidazole with base and by reacting a 1-substituted-2-cyano-5-nitroimidazole with a lower alkanol in the presence of base and treating the product formed with a mineral acid. The 1-substituted-5-nitroimidazole-2-carboxylic acid esters and the 1-substituted - 5 - nitroimidazole-2-carboximidates are useful as intermediates in the synthesis of biologically active 1-substituted-5-nitroimidazole-2-carboxamides.

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3,644,393
**LECITHIN MIXTURES AND REACTION PRODUCTS OF 1,2-DISUBSTITUTED IMIDAZOLINE**
Helen I. Thayer, Oakmont, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 544,838, Apr. 25, 1966. This application Aug. 29, 1969, Ser. No. 854,277
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 2 Claims

The mixture and reaction product of lecithin and certain 1,2-disubstituted imidazolines are useful as gasoline antiwear and antifilter-clogging agents.

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3,644,394
**CONDENSATION PRODUCTS OF N-COUMARIN ALKYLPYRAZOLES AND ALDEHYDES**
John Albert Gurney, Tarrytown, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed June 24, 1968, Ser. No. 739,139
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 6 Claims

Brightening compounds are incorporated as mass brighteners of synthetic polyester and polyacrylonitrile materials to produce a highly fluorescent product characterized by a high degree of retentivity and stability without affecting the desirable properties of the aforesaid synthetic materials. A species of the color brightening compounds is bis [1 - (3-phenylcoumarin-7-yl)-3-methylpyrazol-4-yl]methane.

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3,644,395
**PHENYLBUTAZONE-SODIUM-MONOGLYCERATE**
Heinrich Urwyler, Reinach, Basel-Land, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Dec. 5, 1969, Ser. No. 882,693
Claims priority, application Switzerland, Dec. 11, 1968, 18,458/68
Int. Cl. C07d *49/08*
U.S. Cl. 260—311 1 Claim

Phenylbutazone-sodium-monoglycerate is prepared in crystalline form; the compound is comprised in pharmaceutical compositions and has advantageous properties in the treatment of inflammatory diseases.

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3,644,396
**CHRYSANTHEMUM ACID ESTERS OF 1-SUBSTITUTED PYRROLIDINOLS**
John Martin Clegg, New York, N.Y., and John Swidinsky, Newark, and Bernard Beau Brown, Westfield, N.J., assignors to CPC International Inc.
No Drawing. Filed June 27, 1968, Ser. No. 740,472
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 20 Claims

This application covers chrysanthemum acid esters. More particularly this application covers 1-substituted-3-pyrrolidinol or 1-substituted-3-pyrrolidinyl alkyl esters of chrysanthemum acid, and their use as insecticides.

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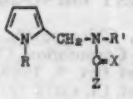
3,644,397
**SUBSTITUTED 2-AMINOMETHYLPYRROLES**
Stephen Raines, Plymouth Meeting, Pa., and Csaba A. Kovacs, Hyattsville, Md., assignors to Richardson-Merrell Inc., New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,145
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.3 7 Claims

Compounds having the generic formula:



wherein R and R' may be hydrogen or lower alkyl; X may be either oxygen or sulfur; and Z may be lower alkyl, lower alkoxy, phenyl, halophenyl, alkoxyphenyl, benzyl, anilino, lower alkylamino, cyclohexylamino, or phenylacetoxymethyl, have useful pharmacological properties as central nervous system depressants. The compounds are prepared by reacting the desired substituted 2-aminomethylpyrrole with acid chlorides or anhydrides, isocyanates, isothiocyanates, or chloroformates to give the desired amide, urea, thiourea, or carbamate derivative.

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3,644,398
**1-CARBAMOYL-3-PHENYLPYRROLIDINES**
Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
No Drawing. Filed Apr. 11, 1969, Ser. No. 815,496
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 7 Claims

1-carbamoyl-3-phenylpyrrolidines useful as muscle relaxants and anticonvulsants are disclosed. The compounds are prepared by reacting 3-phenylpyrrolidines with lower-alkyl isocyanates and N,N-dilower alkyl carbamoyl halides.

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3,644,399
**PYRROLE LOWER ALKANOIC ACIDS AND DERIVATIVES**
Kevan Brown, Reading, and John Frederick Cavalla, Iseworth, Middlesex, England, assignors to John Wyeth & Brothers Limited, Taplow, England
No Drawing. Filed May 1, 1969, Ser. No. 821,075
Claims priority, application Great Britain, May 7, 1968, 21,615/68
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.3 7 Claims

The invention concerns diaryl furan, thiophene, and pyrrole lower alkanoic acids and derivatives which are pharmacologically efficacious as anti-inflammatory agents.

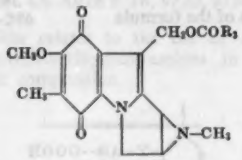
3,644,400

## AZIRIDINO MITOSENES

Keizo Uzu, Kinichi Nakano, and Toshinaka Takahashi, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 8, 1969, Ser. No. 839,921
Claims priority, application Japan, July 23, 1968, 43/51,644
Int. Cl. C07d *27/54*
U.S. Cl. 260—326.3 9 Claims

A process for preparing compounds of the formula



is provided wherein $R_3$ is $NH_2$ or lower alkyl. These compounds are antibiotics.

3,644,401

## N-(2-BENZOYLPHENYL)-2-PYRROLIDINONES

Peter H. L. Wei, Upper Darby, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 10, 1968, Ser. No. 735,534
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 2 Claims

The invention is directed to N-aryl-2-benzoyl-α-oxocyclopolymethylene amines which have anticonvulsant properties particularly in preventing convulsions such as are produced by metrazol or electric shock.

3,644,402

## PROCESS FOR PRODUCING α-PYRROLIDONE

Kazumi Takagi, Teruo Matsuda, and Masahiro Murakami, Niihama-shi, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed May 6, 1969, Ser. No. 822,307
Claims priority, application Japan, May 16, 1968, 43/33,083
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 8 Claims

High yields of α-pyrrolidone are obtained by reacting succinonitrile with hydrogen under pressure in the presence of a hydrogenating catalyst at a temperature of 80° to 200° C. in a nitrogen-containing basic organic solvent for a reaction period shorter than 3.7 minutes and then contacting the thus obtained reaction mixture with water or aqueous ammonia solution at a temperature of 200° to 300° C. Alpha-pyrrolidone is useful as an important raw material of 4-nylon and as a raw material for the production of N-methyl pyrrolidone and N-vinyl pyrrolidone, both useful as a high boiling solvent, or as a fiber raw material.

3,644,403

## 3-SUBSTITUTED-1-PHENYL-INDOLINES

Antonio Canas-Rodriguez and Peter R. Leeming, Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Dec. 15, 1969, Ser. No. 885,321
Claims priority, application Great Britain, Dec. 18, 1968, 60,083/68
Int. Cl. C07d *27/38*
U.S. Cl. 260—326.11 4 Claims

Novel 3-mono-aminoalkyl - 1 - phenyl - indolines and 2-indolinones are disclosed.

3,644,404

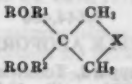
## PROCESS FOR PREPARING HETEROCYCLIC POLYOLS AND ETHER DERIVATIVES

Peter E. Throckmorton, Prior Lake, Minn., assignor to Ashland Oil, Inc., Houston, Tex.

No Drawing. Filed Apr. 21, 1967, Ser. No. 632,562
Int. Cl. C07d *61/00*
U.S. Cl. 260—327 6 Claims

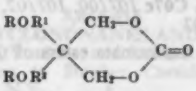
In abstract, the specification discloses a process for preparing a heterocyclic compound of Formula I:

(I)



comprising reacting a carbonate of Formula II:

(II)



with an alkali metal thio or seleno cyanate of Formula III:

(III) QXCN

and formation of the heterocyclic compound by pyrolysis or hydrolysis of said reaction product. In the above formulae, X is sulfur or selenium, $R^1$ and $R^2$ are alkylene radicals of 0 to 8 carbon atoms, R is alkyl of from 1 to 8 carbon atoms or hydrogen and Q is an alkali metal. The polyols of Formula I are used as radiation inhibitors in the products of ADM–446.

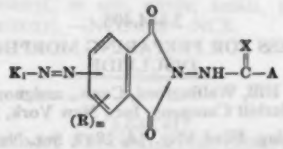
3,644,405

## PHTHALIMIDE CONTAINING MONOAZO DYESTUFFS

Walter Horstmann, Cologne, Dietmar Kalz, Leverkusen, Gerhard Wolfrum, Opladen, and Edgar Siegel, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,225
Claims priority, application Germany, Dec. 6, 1967, P 16 44 236.7
Int. Cl. C09b *29/36*
U.S. Cl. 260—156 2 Claims

Monoazo dyestuffs free from sulfonic acid groups are prepared which are valuable new pigment dyestuffs characterized by good fastness to light, solvents and migration, and by a good thermal stability when used for coloring papers, lacquers, varnishes, synthetic materials, pigment paste and printing colors. The dyestuffs correspond to the general formula



where A stands for an optionally substituted alkyl, aralkyl, carbocyclic or heterocyclic radical or for the radical

where

$R_1$ and $R_2$, independently of one another, mean hydrogen, an optionally substituted alkyl, aralkyl or aryl radical;
X stands for an oxygen or sulfur atom or for NH;
$K_1$ is the radical of a monofunctional coupling component;
R is a substituent; and
*m* is an integer from 0–3.

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**3,644,406**

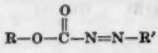
## WATER SOLUBLE AZOFORMATE ESTERS

**Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**No Drawing. Filed Sept. 27, 1968, Ser. No. 763,342**

**Int. Cl. C07c** *107/00, 107/02, 107/04*
**U.S. Cl. 260—192** **5 Claims**

Water soluble azoformate esters of the formula



wherein at least one of R and R′ contains a water solubilizing group, such as 2-hydroxyethyl t-butylazocarboxylate which are useful as polymerization initiators in aqueous medium for polymerization reactions such as vinyl monomer polymerization by the emulsion technique.

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**3,644,407**

## PROCESS FOR THE PREPARATION OF STEROIDAL COMPOUNDS BY CYCLIZATION OF A AND B RINGS

**Michael Rosenberger, Bloomfield, and Gabriel Saucy, Essex Fells, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Filed Jan. 19, 1970, Ser. No. 4,135**

**Int. Cl. C07c** *173/00*
**U.S. Cl. 260—239.55 C** **7 Claims**

Tetracyclic steroidal molecules may be prepared by simultaneous cyclization of the A and B ring. The substrate for this cyclization process is a bicyclic polyketone. The reaction is conducted in the presence of an acid or preferably an acid-base complex system. In a specific embodiment 4-(3,7-dioxo-octyl) - 1a - methylperhydroindan-1,5-dione is converted into 19-nor-androsta-4,9(10)-dien-3,17-dione in the presence of piperidine acetate. The steroidal compounds prepared by the process described herein are useful intermediates in the preparation of steroids having valuable pharmacological activity.

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**3,644,408**

## PROCESS FOR PREPARING MORPHOLINE DISULFIDE

**Harry E. Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., New York, N.Y.**

**No Drawing. Filed Mar. 14, 1969, Ser. No. 807,440**

**Int. Cl. C07d** *87/46*
**U.S. Cl. 260—246 B** **11 Claims**

This disclosure is concerned with an improved process for preparing morpholine disulfide from morpholine and sulfur monochloride. In the improved process, morpholine, solvent, a critical amount of water and a critical amount of alkali metal hydroxide are mixed prior to any sulfur monochloride addition.

**3,644,409**

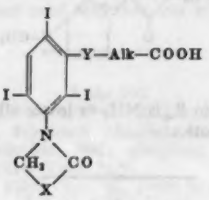
## RADIOPAQUE COMPOUNDS AND METHODS OF PREPARING THE SAME

**Ernst Felder and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica, Societa per Azioni, Milan, Italy**

**No Drawing. Continuation of application Ser. No. 709,778, Mar. 1, 1968. This application May 28, 1970, Ser. No. 41,724**

**Int. Cl. C07d** *27/08, 29/22, 87/30*
**U.S. Cl. 260—247.2** **11 Claims**

Compounds of the formula



are radiopaque, tend to collect in the gall bladder when ingested orally, and are well tolerated, if X has 2–4 carbon atoms and is alkylene or alkylenoxyalkylene, Y is a single carbon-to-carbon bond or oxygen, and Alk is lower alkylene or phenyl-lower-alkylene having not more than four carbon atoms in the alkylene group. The physiologically tolerated salts of the above carboxylic acids have the same effects. The compounds are prepared by closure of the ring

when otherwise similar compounds having the group



are exposed to alkali metal hydroxide in a strongly alkaline aqueous medium and are precipitated when the medium is acidified after ring formation.

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**3,644,410**

## PREPARATION OF TRIALLYL CYANURATE

**Harry D. Gregg, Jr., and Howard V. Lemaster, Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**No Drawing. Filed Feb. 27, 1970, Ser. No. 15,221**

**Int. Cl. C07d** *55/50*
**U.S. Cl. 260—248 CS** **7 Claims**

Triallyl cyanurate is prepared by reacting allyl alcohol with cyanuric chloride in the presence of an alkaline agent under specific conditions allowing the preparation of a very pure product.

3,644,411

## BIOSTATIC USE OF SUBSTITUTED PHENYL-SULFONYL-HYDROXAMINES

Don R. Baker, 3136 Estates Ave., Pinole, Calif. 94564; Llewellyn W. Fancher, 1662 Foothill Park Circle, Lafayette, Calif. 94549; and Malcolm B. McClellan, 1112 Arlington Lane, San Jose, Calif. 95129

No Drawing. Continuation of application Ser. No. 823,217, Feb. 14, 1969, which is a division of application Ser. No. 568,372, July 28, 1966, now Patent No. 3,458,570. This application July 13, 1970, Ser. No. 56,195

Int. Cl. A01n *9/16, 9/20, 9/30*

U.S. Cl. 424—286 12 Claims

This invention relates to the use of certain N-substituted phenylsulfonylhydroxyamines in bacteriostatic and fungistatic composition.

3,644,412

## PROCESS FOR THE PRODUCTION OF N-CARBOXY ANHYDRIDES AND AMINO ACIDS AND DERIVATIVES THEREOF

Yasuo Fujimoto and Masayuki Teranishi, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

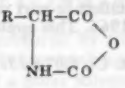
No Drawing. Filed Aug. 23, 1968, Ser. No. 754,999

Claims priority, application Japan, Aug. 23, 1967, 42/53,745

Int. Cl. C07d *85/34*

U.S. Cl. 260—307 B 6 Claims

A process for the preparation of N-carboxy anhydrides of amino acids having the general formula:



which comprises reacting an amino acid or the salts thereof with phosgene in the presence of an organic triester of phosphoric acid. Preferably, the reaction is carried out with heating in an organic solvent.

3,644,413

## 3-PHENYL COUMARINS

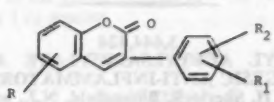
Durvasula V. Rao, Hamden, Adnan A. R. Sayigh, North Haven, and Henri Ulrich, Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,062

Int. Cl. C07d *7/28*

U.S. Cl. 260—343.2 8 Claims

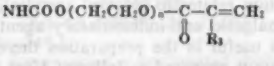
Novel alkoxy-substituted 3-phenylcoumarins of the formula:



wherein R is lower alkoxy, $R_1$ is $NHCOCH_3$,

$NHCOCH{=}CH_2$, NCO

or



wherein $n$ is an integer of from 1 to 3 inclusive and $R_3$ is alkyl of from 1 to 4 inculsive carbon atoms, and $R_2$ is H or $R_1$ are prepared. Such compounds are useful, by virtue of fluorescence in ultraviolet light, as optical brighteners, as ultraviolet stabilizers for plastics such as polyethylene, polyvinylchloride, etc., in the preparation of polyurethane and vinyl polymers and in the preparation of photoresist resins.

3,644,414

## 1-SUBSTITUTED-3-PHENYLPYRROLIDINES

Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Apr. 11, 1969, Ser. No. 815,495

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.3 4 Claims

1-substituted-3-phenylpyrrolidines useful as muscle relaxants and anticonvulsants are disclosed. The compounds are prepared from 3-phenylpyrrolidines.

3,644,415

## THIABICYCLONONANES AND PROCESS

Edward D. Weil, Yonkers, and Keith J. Smith, Lockport, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 482,261, Aug. 24, 1965. This application Aug. 22, 1968, Ser. No. 754,732

Int. Cl. C07d *63/04, 65/04*

U.S. Cl. 260—327 12 Claims

Beta-substituted 9 - thiabicyclo[3.3.1]nonanes, 9-thiabicyclo[4.2.1]nonanes and the 9-oxides and 9-dioxides thereof are new compounds possessing insecticidal and, fungicidal, nematocidal antibacterial, and herbicidal activities.

3,644,416

## SUBSTITUTED 9-THIABICYCLONONENES

Edward D. Weil, Yonkers, and Keith J. Smith, Lockport, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 482,297, Aug. 24, 1965, which is a continuation-in-part of application Ser. No. 260,909, Feb. 25, 1963. This application Aug. 23, 1968, Ser. No. 754,980

Int. Cl. C07d *65/04;* A01n *9/12*

U.S. Cl. 260—327 TH 16 Claims

Compounds of the formula

wherein $t$ is from 0 to 2, and X is a substituent selected from the group consisting of halogen, hydrocarbyloxy, hydrocarbylthio, acyloxy, acylthio, amino or substituted amino, carboxyl, or salt, nitrile, amide, ester or acid halide of carboxyl, —NCO and —NCS.

3,644,417

## CORONARY VASODILATOR COMPOUNDS

Abraham Weber, Paris, Jacques Frossard, Champigny, and Daniel Bouzard, Franconville, France, assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed July 2, 1969, Ser. No. 838,671

Int. Cl. C07d *93/42;* A61k *27/00*

U.S. Cl. 260—327 B 3 Claims

5,5-dioxo-6-methyl-11 - [13 - (N-methyl-N-(1-phenyl-2-propyl)amino)propyl]dibenzo[1,2,5]thiadiazepine possesses coronary vasodilator action and freedom from side effects such as tachycardia and sedative action.

3,644,418

## 2,2-BIS(p-CHLOROPHENYL)-3,3-DIMETHYLOXETANE

George Holan, Brighton, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,111
Claims priority, application Australia, Feb. 20, 1968, 33,896/68
Int. Cl. C07d 3/00
U.S. Cl. 260—333 1 Claim

The invention provides a new compound 2,2-bis(p-chlorophenyl)-3,3-dimethyloxetane having insecticidal properties. It may be made by irradiating a mixture of 4,4'-dichlorobenzophenone and isobutylene with ultra-violet radiation or by reacting p-chlorobenzenemagnesium halide with β-bromopivaloyl chloride.

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3,644,419

## 2,3,4,9 - TETRAHYDRO - 9 - PHENYL-OXAZIRINO-[2,3-d][1,4]BENZODIAZEPINES AND PREPARATION THEREOF

Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application June 19, 1967, Ser. No. 647,226, now Patent No. 3,498,973, dated Mar. 3, 1970, which is a division of application Ser. No. 267,908, Mar. 25, 1963. Divided and this application Dec. 5, 1969, Ser. No. 882,745
Int. Cl. C07d 53/06, 85/02
U.S. Cl. 260—333 1 Claim

Novel 2,3,4,9-tetrahydro - 9 - phenyl-oxazirino[2,3-d]-[1,4]benzodiazepines and preparation thereof prepared via oxidation of 2,3-dihydro-5-phenyl-1H-1,4-benzodiazepines, are described. These novel products are useful as intermediates in the preparation of 2,3-dihydro-5-phenyl-1H-1,4-benzodiazepine 4-oxides, useful as anti-convulsant agents.

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3,644,420

## XANTHENE DERIVATIVES

Stewart Sanders Adams, Bernard John Armitage, Norman William Bristow, and Bernard Vincent Heathcote, Nottingham, England, assignors to Boots Pure Drug Company Limited, Nottingham, England

No Drawing. Filed Aug. 23, 1967, Ser. No. 662,587
Claims priority, application Great Britain, Sept. 2, 1966, 39,384/66; Apr. 5, 1967, 15,692/67
Int. Cl. C07d 7/42
U.S. Cl. 260—335 3 Claims

Xanthene derivatives having utility in the treatment of peptic ulceration.

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3,644,421

## 4-OXA-3-KETO-$\Delta^1$-PREGNENE DERIVATIVES

Alexander D. Cross, Mexico City, Mexico, assignor to Syntex Corporation, Panama, Panama

No Drawing. Continuation-in-part of application Ser. No. 411,554, Nov. 16, 1964, now Patent No. 3,417,106. This application Dec. 2, 1968, Ser. No. 780,580
Int. Cl. C07d 19/00
U.S. Cl. 260—340.5 8 Claims

This discloses, as new compounds, 4-oxa-3-keto-$\Delta^1$-pregnene steroids including the 19-nor derivatives and those containing optional substitutions at positions C–16 and C–17α. These compounds are progestational agents, have anti-androgenic, anti-gonadotrophic, and estrogenic properties and are useful in fertility control, in the treatment of premenstrual tensions, in lowering blood cholesterol levels, and in the treatment of acne, benign prostate hypertrophy and hirsutism. Also disclosed are methods and intermediates useful for the preparation of these compounds.

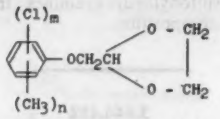
3,644,422

## 2-(SUBSTITUTED PHENOXYMETHYL) DIOXOLANES

Akihiko Mine, Minoo-shi, Takeo Satomi, Takarazuka-shi, Naganori Hino and Katsuzo Kamoshita, Toyonaka-shi, and Yoshitsugu Suzuki and Shinji Nakai, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Mar. 26, 1970, Ser. No. 22,996
Claims priority, application Japan, Apr. 7, 1969, 44/27,050
Int. Cl. C07d 13/04
U.S. Cl. 260—340.9 4 Claims

Phenoxyacetaldehyde ethyleneacetal derivatives represented by the formula,



wherein *m* and *n* are 0 or an integer of 1 to 5, and the sum of *m* and *n* is 1 to 5, which may be useful as herbicidal compositions with high herbicidal activities on both broad-leaved and grass weeds and lower toxicities on fishes.

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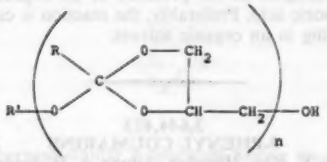
3,644,423

## ORTHOESTERS DERIVED FROM GLYCEROL

David F. Roswell, Baltimore, David E. Kramm, Laurel, and Louis L. Wood, Potomac, Md., and Thomas R. Steadman, Convent Station, N.J., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 574,259, Aug. 22, 1966. This application June 10, 1969, Ser. No. 832,030
Int. Cl. C07d 13/04
U.S. Cl. 260—340.9 4 Claims

In abstract, this invention is directed to an orthoester having the formula



where R is hydrogen or lower alkyl and R' is lower alkyl and *n* is an integer from 1–20 and to a method for preparing said orthoester by reacting glycerol with an orthoester having the formula $R—C(OR')_3$ where R and R' are as defined supra, all as recited hereinafter.

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3,644,424

## GLYCERYL ACETYLSALICYLATE AND ITS ANALGESIC ANTI-INFLAMMATORY USE

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Continuation-in-part of application Ser. No. 629,414, Apr. 10, 1967. This application Oct. 16, 1969, Ser. No. 867,061
Int. Cl. C07d 13/04; C07c 69/84
U.S. Cl. 260—340.9 2 Claims

The invention relates to glyceryl acetylsalicylate, to its use as an analgesic anti-inflammatory agent, and to the intermediates useful in the preparation thereof. Glyceryl acetylsalicylate is prepared as follows: Heat salicylic acid and chloroacetonitrile at reflux in the presence of triethylamine and transesterify the resulting cyanomethyl salicylate with excess quantities of 2,2-dimethyl-1,3-dioxolane-4-methanol by heating in the presence of potassium carbonate to yield β,γ - isopropylidenedioxypropyl

salicylate. Acetylate the sodium salt of β,γ-isopropylidenedioxypropyl salicylate and hydrolyze the resulting β,γ-isopropylidenedioxypropyl-o-acetoxybenzoate to yield β,γ-dihydroxypropyl-o-acetoxybenzoate. Alternate methods for the preparation of the desired compounds are also described.

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3,644,425

## 10-METHYL-13-ETHYLGON-4,9(11)-DIENES

Herchel Smith and David R. Herbst, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

Original application Aug. 4, 1967, Ser. No. 658,444, now Patent No. 3,491,131, dated Jan. 20, 1970. Divided and this application Apr. 9, 1969, Ser. No. 821,546

Int. Cl. C07d *101/00*

U.S. Cl. 260—343.2 S 1 Claim

10β - methyl-13β-ethylgon-4,9(11)-dienes having progestational and antiestrogenic activity are prepared from 13β-ethylgon-4-enes by a sequence of reactions, including ozonization at the 4-position unsaturation, introduction of unsaturation at the 9-position, addition of a methyl group at the 10-position, and reformation of the A-ring.

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3,644,426

## PREPARATION OF DELTA VALERO-LACTONES

Robert A. Dombro, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 578,505, Sept. 12, 1966. This application Aug. 15, 1969, Ser. No. 850,668

Int. Cl. C07d *7/06*

U.S. Cl. 260—343.5 10 Claims

Lactones may be prepared by treating mercaptans or disulfides with an oxidizing agent such as dimethyl sulfoxide in the presence of a polar solvent such as an alcohol, in an alkaline solution, such as sodium hydroxide at an elevated temperature. Thus, n-propyl mercaptan can be converted to alpha, gamma-dimethyl delta-valerolactone.

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3,644,427

## SYNTHESIS OF 3-HALOALKYL HYDROCARBON-CARBOXYLATES AND 4-HALOTETRAHYDRO-PYRANS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,311

Int. Cl. C07d *7/04*; C07c *69/00*

U.S. Cl. 260—345.1 9 Claims

A 3-haloalkyl hydrocarboncarboxylate and a 4-halotetrahydropyran are produced by reacting a 1-alkene, $(HCHO)_n$, a hydrogen halide and an acid halide at a temperature in the range of −80 to −30° C., wherein *n* is the integer 1 or greater.

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3,644,428

## PRINS-TYPE REACTIONS

Hugh Stewart Inglis, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 22, 1969, Ser. No. 843,827

Claims priority, application Great Britain, Aug. 29, 1968, 41,358/68

Int. Cl. C07d *7/08, 15/02*

U.S. Cl. 260—345.1 16 Claims

A process for reacting a conjugated diolefin, e.g. 1,3-butadiene, with formaldehyde to give a product comprising a major proportion of a dihydropyran, e.g. 5,6-dihydro-2H-pyran in which the reaction takes place in the presence of a Lewis acid catalyst and a substantially non-aqueous solvent.

3,644,429

## SUBSTITUTED BENZ[e]INDENES AND PHENANTHRENES AND PROCESS

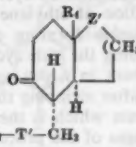
Zoltan George Hajos, Upper Montclair, and Eugene Paul Oliveto, Glen Ridge, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 687,463, Dec. 4, 1967, which is a continuation-in-part of application Ser. No. 544,677, Apr. 25, 1966, which in turn is a continuation-in-part of application Ser. No. 495,672, Oct. 13, 1965. This application Dec. 23, 1968, Ser. No. 786,445

Int. Cl. C07d *7/04*

U.S. Cl. 260—345.9 7 Claims

Methods for the preparation of 2,3,3a,4,5,7,8,9,9aβ,9bα-decahydro - 3aβ - primary lower alkyl - 7 - oxo - 1H-benz[e]indenes and 4,4aβ,4bα,5,6,7,8,8a,9,10 - decahydro-8aβ - primary lower alkyl - 3H - phenanthren - 2 - ones by cyclizing compounds of the formula




wherein $R_1$ is hydrogen or lower alkyl; Z' is carbonyl or $CH(OR_2')$; $R_2'$ is hydrogen, lower alkyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxybenzoyl, trifluoroacetyl or camphorsulfonyl; T' is $—C(X')=CH—$, $—C(OR_3)=CH—$ or $—Q'—CH_2—$; $R_3$ is lower alkyl; X' is bromine, chlorine or iodine; Q' is carbonyl, lower alkylene dioxy-methylene, di-(lower alkoxy)-methylene or hydroxy-methylene, $R_4$ is lower primary alkyl and *m* is an integer having a value of 1 or 2.

The compounds of this series are useful as intermediates in the synthesis of known steroids which are pharmacologically active as fertility control agents.

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3,644,430

## UNSATURATED ALDEHYDE

Karl-Heinrich Schulte-Elte, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland

No Drawing. Filed July 25, 1969, Ser. No. 845,101

Int. Cl. C07d *1/12*

U.S. Cl. 260—348 R 3 Claims

4,5-epoxy-2-penten-1-al, which is useful as an intermediate in various organic syntheses, is disclosed together with a process for its preparation which comprises oxidizing cyclopentadiene by means of singlet oxygen.

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3,644,431

## DIGLYCIDYL ESTERS OF ALIPHATIC DICARBOXYLIC ACIDS

Alfred Heer, Birsfelden, and Werner Schaffner, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Sept. 19, 1969, Ser. No. 859,578

Claims priority, application Switzerland, Sept. 30, 1968, 14,560/68

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 A 10 Claims

New diglycidyl esters of branched-chain paraffin-dicarboxylic acids, the carboxyl groups of which are linked by a linear $C_1$–$C_{10}$-alkylene chain which is substituted by 2 to 6 $C_1$–$C_4$-alkyl groups, above all technical trimethyladipic acid diglycidyl ester. Compared to the known adipic acid diglycidyl esters, the new diglycidyl esters inter alia possess the advantages of storage stability, of greater difficulty of saponification of the ester groups and of lesser water absorption of the cured mouldings. The relatively low curing temperatures required with the usual hot-curing agents (for example 60–70° C. with hexahydrophthalic anhydride) are surprising. Trimethyladipic acid diglycidyl ester is above all suitable for use as reactive diluent for

other epoxide resins, because in contrast to the known diluents the mechanical properties of the cured mouldings are not worsened, but on the contrary, are improved.

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3,644,432

## PROCESS FOR RECOVERING ETHYLENE OXIDE

**Robert Hoch, Brooklyn, and Harold Gilman, Millwood, N.Y., assignors to Halcon International, Inc.**

**Continuation-in-part of application Ser. No. 651,012, July 3, 1967. This application Sept. 30, 1969, Ser. No. 862,341**

**Int. Cl. C07d** *1/14*

**U.S. Cl. 260—348** **4 Claims**

This invention relates to a process for the recovery of ethylene oxide from the rich cycle gas resulting from the vapor phase reaction of ethylene with molecular oxygen under ethylene oxide forming conditions. Recovery is effected by scrubbing the rich cycle gas with a non-aqueous liquid absorbent in a dry system at cryogenic conditions and thereafter stripping the absorbent from ethylene oxide absorbate which is then refined to the desired product. Advantages of the process reside in the elimination of the usual glycol make accompanying recovery in an aqueous system and in the abtention of high ethylene oxide concentrations in the liquid phase. The inventive process may advantageously provide an absorbent inventory for continuous process operation by condensation and recycling of overhead absorbent from the stripper. The invention is of particular value in an ethane ballasted-high purity oxygen system utilizing liquid ethane as absorbent; the high ethane partial pressures may be availed of to raise the temperature level of the refrigeration required and thereby reduce its cost.

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3,644,433

## INCREASING AUTOIGNITION TEMPERATURE OF $CS_2$

**John A. Bichard, Point Edward, Ontario, and Jackson Eng, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company**

**No Drawing. Filed Mar. 20, 1970, Ser. No. 21,489**

**Int. Cl. C23g** *5/04*

**U.S. Cl. 252—364** **2 Claims**

A composition of matter suitable for cleaning oil and gas wells and for sulfiding a hydrotreating catalyst which comprises carbon disulfide containing 5–40 lv. percent, preferably 10–30%, of a refinery stream boiling below 250° F., chosen from the group consisting of catalytically cracked naphtha and coker naphtha.

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3,644,434

## ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANE ELASTOMER MATERIALS

**Paul Hittmair, Wolfgang Kaiser, Siegfried Nitzsche, and Ernst Wohlfarth, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany**

**No Drawing. Filed Dec. 10, 1968, Ser. No. 782,771**

**Claims priority, application Germany, Dec. 14, 1967, W 45,346**

**Int. Cl. C08k** *1/10*

**U.S. Cl. 260—375 B** **6 Claims**

Non-slump room temperature vulcanizable silicone rubber formulations based on hydroxyl endblocked linear siloxane polymers and amino cross-linking agents are prepared by adding silica fillers with surface area in the range from 100 to 200 $m.^2/g.$ and alkali aluminum silicate or alkali earth metal aluminum silicate molecular sieve to the formulations.

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3,644,435

## 6-ALKYL OR 6-ALKENYL-2,3-DIMETHOXY-5-HYDROXY-1,4-BENZOQUINONES AND HYDROQUINONES

**Karl Folkers, 177 Gaya Road, Portola Valley, Calif. 94026; Joseph C. Catlin, 872 Colorado Ave., Palo Alto, Calif. 94303; and Glenn Doyle Daves, Jr., 1530 SE. Blakeney, Beaverton, Oreg. 97005**

**No Drawing. Filed June 20, 1968, Ser. No. 738,393**

**Int. Cl. C07c** *49/74, 43/22*

**U.S. Cl. 260—396 R** **13 Claims**

The disclosure describes novel 6-alkyl and 6-alkenyl derivatives of 2,3 - dimethoxy - 5-hydroxy-1,4-benzoquinones and hydroquinones which are useful as antioxidants and inhibitors of succinoxidase and DPNH-oxidase in mitochondrial systems. The compounds are prepared by reacting 2,3 - dimethoxy - 5-hydroxy-1,4-benzohydroquinone with an allylic alcohol or by decomposing a diacylperoxide in the presence of 2,3-dimethoxy-5-hydroxy-1,4-benzoquinone.

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3,644,436

## BIS(AMIDINOHYDRAZONES) OF STEROIDAL DIONES

**Gerhard R. Wendt, Havertown, Kurt W. Ledig, Philadelphia, and Daniel M. Teller, King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 594,390, Nov. 15, 1966. This application Apr. 30, 1969, Ser. No. 820,646**

**Int. Cl. C07c** *169/00*

**U.S. Cl. 260—397** **8 Claims**

The disclosure is directed to bis(amidinohydrazones) of gona-3,17-diones and 18,19-dinorpregna-3,20-diones. The compounds have cardiotonic activity.

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3,644,437

## 17α - ALKYNYL - 17β-ALKYLGON-13-ENES, PROCESSES THEREFOR AND PRODUCTS THEREFROM

**Reinhardt P. Stein, Conshohocken, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.**

**No Drawing. Filed Aug. 22, 1969, Ser. No. 852,448**

**Int. Cl. C07c** *169/08, 169/22*

**U.S. Cl. 260—397.3** **21 Claims**

Compounds of the 17α-(lower) alkynyl-17β-(lower) alkylgon - 13 - ene series, optionally substituted at C–16 with (lower)alkyl (I) are provided by treating the corresponding 17α - (lower)alkynyl - 13β - (lower)alkylgon-17β-ols (II) with a solution of phosphorus oxychloride in dimethylformamide at elevated temperatures for relatively short reaction times. Compounds (I) of the gona-1,3,5(10)-triene series and the esters of the gona-5-en-3-ol series are useful to prepare progestationally and antiandrogenically active compounds by known methods.

## 3,644,438
## 6-HYDROXYMETHYL-15β,16β-METHYLENE PREGNENES AND PROCESS

Andor Furst, Basel, Dieter Kagi, Allschwil, Marcel Muller, Frenkendorf, and Peter Muller, Arlesheim, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,737
Claims priority, application Switzerland, Apr. 23, 1969, 6,142/69
Int. Cl. C07c *169/32*
U.S. Cl. 260—397.4 6 Claims

Medicinally valuable 6-methyl-15β,16β-methylene pregnenes are obtained from novel correspondingly substituted 6-hydroxymethyl-15β,16β-methylene pregnenes by a two step procedure. The 6-hydroxymethyl-15β,16β-methylene pregnenes are obtained by treatment of a 6-unsubstituted-15β,16β-methylene pregnene with formaldehyde.

## 3,644,439
## 3-HYDROXY- AND 3-ETHER-1,3,5(10),7-DEHYDROSTEROIDS

Gordon Hanley Phillipps, Greenford, Middlesex, England, assignor to Glaxo Laboratories, Limited, Greenford, England

No Drawing. Continuation-in-part of application Ser. No. 559,066, June 21, 1966. This application Mar. 4, 1969, Ser. No. 804,280
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 19 Claims

The process comprises the general steps of reacting a 2,5(10),7-dehydrosteroid-3-ether with a halogenating agent and subsequently dehydrohalogenating the reaction product to yield a 3-hydroxy- or 3-ether-1,3,5(10),7-dehydrosteroid. Conveniently the initial reaction is carried out in a basic medium. The compounds according to the invention comprise 17α-ethynyl-3-methoxyoestra-2,5(10),7-trien-17-β-ol 17α-ethynyl-3-methoxyoestra-1,3,5(10),7-tetraen-17β-ol and its 17-acetate, 17α-chloroethynyl-3-methoxyoestra-1,3,5(10),7-tetraen-17β-ol and 3-cyclopentyloxy-17α-ethynyloestra-1,3,5(10),7-tetraen-17β-ol.

## 3,644,440
## 6-SUBSTITUTED-13-POLYCARBON-ALKYL-18,19-DINORPREGN-4-EN-3-ONES

George H. Douglas, Paoli, Daniel M. Teller, King of Prussia, and Herchel Smith, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 748,606, July 30, 1968. This application May 19, 1969, Ser. No. 825,974
Int. Cl. C07c *169/32, 169/34*
U.S. Cl. 260—397.4 2 Claims

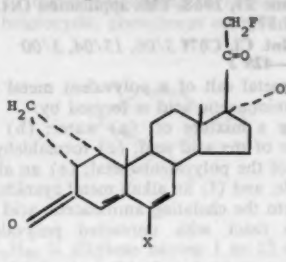
New steroids of the 13-polycarbonalkyl-18,19-dinorpregn-4-en-3-one series and $\Delta^6$-dehydro analogs thereof, substituted at $C_6$ by methyl, chloro, bromo or fluoro; at $C_{17}$ by hydrogen, hydroxy or acyloxy, and wherein $C_{20}$ is carbonyl, hydroxymethylene or acyloxymethylene (I) have hormonal activity, especially as progestational and anti-estrogenic agents. Means to obtain them are provided comprising (a) hydrogenating the corresponding 6-methylene compound (II) to form the 6α-methyl-4-en-3-one (Id); (b) rearranging (II) with a weak base+Pd/C to form the 6-methyl-4,6-dien-3-one (Ie); (c) chlorinating or brominating the corresponding 3-enol ester (III) to form the 6-chloro or -bromo-4-en-3-one (If); and (d) either (1) dehydrogenating (If) with chloranil to form the 6-chloro or -bromo-4,6-dien-3-one (Ig), or preferably, (2) reacting the corresponding 6α,7α-epoxide (IV) with HCl, HBr or HF to form the corresponding 6-chloro, -bromo or -fluoro-4,6-dien-3-one (Ih).

## 3,644,441
## METHOD FOR THE PRODUCTION OF 21-FLUORO-4,6-PREGNADIENES

Rudolf Wiechert, Friedmund Neumann, and Henry Laurent, Berlin, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany

No Drawing. Continuation of application Ser. No. 659,000, Aug. 8, 1967. This application Nov. 17, 1969, Ser. No. 871,613
Int. Cl. C07c *167/28*
U.S. Cl. 260—397.47 2 Claims

1. The method for the production of 21-fluoro-delta$^{4,6}$-pregnadienes of the general formula:




wherein X is selected from the group consisting of fluorine and chlorine and R is acyl radical of a physiologically tolerable aliphatic carboxylic acid having up to 16 carbon atoms, comprising:

(a) reacting an ester of a 21-fluoro-6,7-oxido-1,2α-methylene-delta$^4$-pregnene - 17α - ol - 3,20 - dione in an organic acid with hydrochloric acid forming the 6 - chloro-delta$^6$ group and opening the 1,2-methylene linkage forming the 1-chloro-methyl group;

(b) removing the resultant water formed in step (a) by means of a strong acid, thereby creating a 6x-delta$^6$ configuration and forming a 4,6-double bond;

(c) effecting reclosure of the 1,2α-methylene ring opened in steps (a) and (b) by the action of a reagent selected from the group consisting of an organic base and aluminum oxide, to form a 6-halo-21-fluoro-1,2α-methylene-delta$^{4,6}$-pregnadiene - 17α-ol - 3,20-dione ester.

## 3,644,442
## SUBSTITUTED BIS ORGANO SULFONES AND SULFOXIDES AND METHOD FOR THE PREPARATION THEREOF

Robert A. Grimm, Lakeville, Minn., and Robert C. Slagel, Pittsburgh, Pa., assignors to Ashland Oil, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 544,391, Apr. 22, 1966, which is a continuation-in-part of abandoned application Ser. No. 458,375, May 24, 1965. This application Nov. 6, 1969, Ser. No. 874,368
Int. Cl. C07c *143/90*
U.S. Cl. 260—400 21 Claims

A class of bis organo sulfone and sulfoxide derivatives are provided by the reaction of an ethylenically unsaturated compound with sulfur dichloride to form the corresponding dichloride diadduct of which the chloro substituents are converted to a variety of other functional groups and thereupon the thioether is oxidized to either the corresponding sulfone or sulfoxide.

## 3,644,443
## PREPARATION OF CARBOXYLIC ACIDS

Ronald L. Shubkin, Oak Park, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Dec. 8, 1969, Ser. No. 883,307
Int. Cl. C07c *51/14*
U.S. Cl. 260—413 14 Claims

An integral process for preparing carboxylic acids from olefins having about 10 or more carbon atoms containing

water and carbon monoxide using a cobalt catalyst and a ketone or ether solvent combined with a cobalt recovery step which permits direct recycle of the catalyst so recovered for use in the carboxylation process.

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3,644,444

## PRODUCTION OF METAL CHELATES

**Felix B. Popper and Albert H. Levesque, Nashua, N.H., assignors to W. R. Grace & Co., New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 740,488, June 27, 1968. This application Oct. 15, 1970, Ser. No. 81,177**

**Int. Cl. C07f** *3/06, 15/04, 3/00*

**U.S. Cl. 260—429 J** **8 Claims**

An alkali metal salt of a polyvalent metal chelate of a chelating aminoacetic acid is formed by:

(1) Boiling a mixture of; (a) water; (b) an amine precursor of the said acid; (c) formaldehyde; (d) a cyanide of the polyvalent metal; (e) an alkali metal hydroxide; and (f) an alkali metal cyanide, and adding thereto the chelating aminoacetic acid in its free form to react with unreacted polyvalent metal cyanide.

(2) Boiling a mixture of; (a) water; (b) an amine precursor of the said acid; (c) formaldehyde; (d) a polyvalent metal hydroxide or oxide; (e) an alkali metal hydroxide; and (f) hydrogen cyanide and adding thereto the chelating aminoacetic acid in its free form to react with unreacted polyvalent metal hydroxide or oxide.

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3,644,445

## CYCLOMATIC METAL CARBONYLS CONTAINING METAL-METAL BOND

**Wolfram R. Kroll, Linden, N.J., assignor to Esso Research and Engineering Company**

**No Drawing. Continuation-in-part of application Ser. No. 600,032, Dec. 8, 1966. This application Mar. 17, 1969, Ser. No. 807,998**

**Int. Cl. C07f** *5/06*

**U.S. Cl. 260—429** **10 Claims**

A catalyst formed by the reaction of a transition metal carbonyl hydride, particularly a Group VI transition metal, and an organoaluminum compound has unusual activity, especially as a catalyst for hydrogenation, polymerization, dimerization and oxo type reactions.

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3,644,446

## PREPARATION OF RHODIUM AND IRIDIUM HYDRIDE CARBONYL COMPLEXES

**Frank B. Booth, Placentia, Donald M. Fenton, Anaheim, and Kenneth L. Olivier, Placentia, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**No Drawing. Filed July 1, 1969, Ser. No. 838,356**

**Int. Cl. C07f** *15/00*

**U.S. Cl. 260—429 R** **10 Claims**

Hydride carbonyl complexes of rhodium and iridium with biphyllic ligands are prepared by treatment of rhodium or iridium, complexes or salts thereof with an alkali metal hydroxide, alkoxide or aryloxide and a biphyllic ligand and a mild reducing agent. In a typical synthesis a rhodium carbonyl salt is contacted with an alkali metal alkoxide in the presence of the ligand and the hydride is formed by subsequent or simultaneous contacting with a reducing agent such as hydrogen, carbon monoxide or an oxidizable alcohol. The compounds have utility as hydroformylation catalysts.

3,644,447

## TRANSITION METAL COMPOUNDS

**Kamalakant Krishnarao Joshi, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed June 2, 1969, Ser. No. 829,801**

**Claims priority, application Great Britain, June 18, 1968, 29,016/68**

**Int. Cl. C07f** *7/28, 15/00*

**U.S. Cl. 260—429 R** **4 Claims**

Bridged dinuclear transition metal compounds are prepared by the reaction of a first transition metal compound having two non-chelating ligands containing electron-donating groups, in cis positions relative to each other, with a second transition metal compound containing two displaceable ligands also in cis positions relative to each other, so that a bridged dinuclear product is formed with the elimination of the displaceable ligands.

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3,644,448

## CRYSTALLINE HYDRATES OF ALKALI METAL SALTS OF ZINC TRANS-1,2-DIAMINOCYCLOHEXANE-N,N,N',N'-TETRAACETATE

**Robert C. O'Neill, Newark, N.J., assignor to Cooper, Tinsley Laboratories, Inc., Mystic, Conn.**

**No Drawing. Original application Jan. 3, 1967, Ser. No. 606,576, now Patent No. 3,501,576, dated Mar. 17, 1970. Divided and this application Nov. 13, 1969, Ser. No. 871,289**

**Int. Cl. C08f** *3/06*

**U.S. Cl. 260—429.9** **3 Claims**

The crystalline hydrates of the sodium and potassium salts of the zinc chelate of trans-1,2-diaminocyclohexane-N,N,N',N'-tetraacetic acid ($Na_2ZnCDTA$ and

$K_2ZnCDTA$)

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3,644,449

## BIS(PERFLUOROALKYL) NITROXIDE MERCURIDE

**Russell R. Reinhard, Hopewell Junction, N.Y., and William D. Blackley, Lake Elmo, Minn., assignors to Texaco Inc., New York, N.Y.**

**No Drawing. Filed Mar. 27, 1969, Ser. No. 811,199**

**Int. Cl. C08f** *3/10*

**U.S. Cl. 260—431** **4 Claims**

Bis(perfluoroalkyl) nitroxide mercuride and method of preparation comprising contacting bis(perfluoroalkyl)-nitroxide with mercury at a temperature of between about −10 and 35° C., under conditions of agitation, said mercuride being readily reconvertible at temperatures between about 50 and 100° C. into said nitroxide and mercury reactants.

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3,644,450

## METHOD OF MAKING ALKYL LEAD COMPOUNDS

**Shirl E. Cook and Kenneth C. Williams, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.**

**No Drawing. Filed Aug. 7, 1969, Ser. No. 848,358**

**Int. Cl. C07f** *7/24*

**U.S. Cl. 260—437 R** **16 Claims**

A method of making alkyl lead compounds and derivatives thereof, wherein an organoleadmagnesium halide is prepared from a Grignard reagent (RMgX, wherein R is an organic radical and X a halogen) and a lead halide or lead carboxylate and then reacted with an organic polyhalide to form the alkyl lead compound.

3,644,451

## ORGANOLEAD MAGNESIUM COMPOUNDS

Kenneth C. Williams and Shirl E. Cook, East Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 848,358, Aug. 7, 1969. This application Oct. 17, 1969, Ser. No. 867,351

Int. Cl. C07f 7/24

U.S. Cl. 260—437 R 11 Claims

Stabilized trialkylleadmagnesium halides as new compositions of matter and method of making same wherein a Grignard reagent (RMgX, wherein R is an organic radical and X a halogen) is reacted with a lead halide or lead carboxylate in the presence of an ether more basic than diethyl ether.

3,644,452

## METHOD OF MAKING ORGANOLEAD-SILICON COMPOUNDS

Kenneth C. Williams, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,877

Int. Cl. C07f 7/24

U.S. Cl. 260—437 R 17 Claims

A method of making organolead-silicon compounds wherein an organosilicon Grignard reagent is reacted with a lead halide to form an intermediate organolead-silicon-magnesium halide and said complex halide is then reacted with a hydrocarbon or organohalide to form an organolead-silicon compound.

3,644,453

## CUPROUS HALIDE AND ADIPONITRILE COMPLEXES

Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,379

Int. Cl. C07f 1/08

U.S. Cl. 260—438.1 2 Claims

The present invention is directed to novel chemical complexes of cuprous bromide, cuprous chloride and adiponitrile. The complexes are useful, for example, as catalysts, as promoters, as a source of adiponitrile, as paint dryers and the like.

3,644,454

## CHROMIUM COMPLEXES OF FLUOROCARBON ACIDS

Louis G. Anello, Basking Ridge, and Richard F. Sweeney, Randolph Township, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,832

Int. Cl. C07f 11/00

U.S. Cl. 260—438.5 C 9 Claims

Chromium complexes of propionic and butyric acids substituted in the 3- or 4-position, respectively, with a fluorinated alkoxy group, said alkoxy group terminated with a highly fluorinated branched chain or cyclic fluoroalkoxy group. These chromium complexes are useful as treating agents to impart oil and water resistance to various substrates, including paper, leather, and the like.

3,644,455

## FERROUS HALIDE ADIPONITRILE COMPLEXES

Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,380

Int. Cl. C07c 121/26; C07f 15/02

U.S. Cl. 260—439 R 2 Claims

The present invention is directed to novel chemical complexes of ferrous bromide or ferrous chloride and adiponitrile. The complexes are useful, for example, as catalysts, as promoters, as a source of adiponitrile, as paint dryers and the like.

3,644,456

## DI[(ISOCYANATOBENZYL)-PHENYL] CARBODIIMIDES AND PREPARATION OF ORGANIC CARBODIIMIDES

Henri Ulrich, Northford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Aug. 12, 1964, Ser. No. 389,193, now Patent No. 3,522,303, dated July 28, 1970. Divided and this application Mar. 20, 1970, Ser. No. 21,477

Int. Cl. C07c 119/04; C07f 9/22

U.S. Cl. 260—453 AR 10 Claims

Organic isocyanates (mono- and poly-isocyanates) are converted to the corresponding carbodiimides using as catalyst a heterocyclic phosphorus compound of the formula:

wherein $C_nH_{2n}$ is alkylene having 1 to 12 carbon atoms from 1 to 3 of which form a chain separating Y from N, R' is hydrocarbyl (1 to 18 carbon atoms) which can be substituted by halo, nitro, alkoxy, alkylmercapto and cyano, R'' is hydrogen, hydrocarbyl (1 to 18 carbon atoms) or —CONHR''' where R''' is hydrocarbyl (1 to 18 carbon atoms) and Y is O or —NR'' where R'' is as above.

3,644,457

## PREPARATION OF STABLE LIQUID DIPHENYLMETHANE DIISOCYANATES

Klaus König and Erwin Müller, Leverkusen, and Hans Holtschmidt, Leverkusen-Steinbuchel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,787

Claims priority, application Germany, Mar. 8, 1967, F 51,751

Int. Cl. C07c 119/04

U.S. Cl. 260—453 SP 1 Claim

Solid 4,4'- and/or 2,4'-diphenylmethane diisocyanate are reacted with a branched aliphatic dihydroxy compound in the molar ratio of 0.1 to 0.3 mol of dihydroxy compound per mol of diisocyanate to prepare a product which is liquid at room temperature.

3,644,458

## β-HALOGENOALKYL ISOCYANATES

Klaus-Dieter Kampe, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

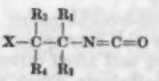
No Drawing. Filed May 7, 1968, Ser. No. 727,347

Claims priority, application Germany, May 9, 1967, F 52,364

Int. Cl. C07c 119/04

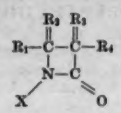
U.S. Cl. 260—453 AL 1 Claim

β-Halogenoalkyl isocyanates of the formula



in which X represents a chlorine or bromine atom, $R_1$, $R_2$, $R_3$ and $R_4$ represent hydrogen atoms or saturated or unsaturated aliphatic, cycloaliphatic, araliphatic, aromatic

or heterocyclic radicals are prepared by reacting a lactam of the formula



in which X, $R_1$, $R_2$, $R_3$ and $R_4$ are defined above, in the presence of an olefine and/or an acetylene with a radical-forming catalyst. The reaction products are intermediates for the manufacture of compounds used in the field of plant protection, synthetic materials and textile finishing.

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3,644,459

## ISOMERIC MIXTURES OF METHYLCYCLOHEXYLENE DIISOCYANATE

James M. Cross, New Martinsville, W. Va., assignor to Mobay Chemical Company, Pittsburgh, Pa.

No Drawing. Application June 12, 1967, Ser. No. 645,476, now Patent No. 3,424,792, which is a continuation-in-part of applications Ser. No. 523,569, Jan. 28, 1966, and Ser. No. 614,395, Feb. 2, 1967. This application May 15, 1968, Ser. No. 729,458

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 A 2 Claims

Methylcyclohexylene diisocyanates are prepared by phosgenating the hydrogenolysis product of tolylene diamine. Methylcyclohexylene diisocyanates are provided wherein from about 85 to about 95 percent of the isomers have a diequatorial or ee conformation and about 5 to about 15 percent of the isomers have an axial-equatorial or ae conformation.

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3,644,460

## PREPARATION OF AROMATIC ISOCYANATES

Eric Smith, Madison, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,866

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 P 19 Claims

The process for preparing an organic iscyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst system comprising (a) a halide of a noble metal and (b) an aryl halo compound of a metal selected from Groups IIb, IIIb and IVb of the Periodic Table or a complex of (a) and (b). Preferred aryl halo compounds include diaryl lead dihalides, diaryl germanium dihalides, aryl boron dihalides and aryl mercuric halides. The noble metal halide is preferably a halide of palladium, rhodium, iridium, rhenium, platinum, and mixtures thereof. The catalyst system may also include molybdenum trioxide or another metal oxide.

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3,644,461

## PREPARATION OF ALKYL ISOCYANATES

Kenneth C. Rennells, Whitehall, Mich., assignor to The Ott Chemical Company

No Drawing. Filed Feb. 19, 1969, Ser. No. 800,778

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 P 6 Claims

A method of dehydrochlorinating an alkyl carbamyl chloride to provide the corresponding alkyl isocyanate derivative by heating said alkali carbamyl chlorine in the presence of a tetraalkylurea which acts as an acid acceptor, thereby promoting said dehydrochlorination. The alkyl isocyanate is then separated from the tetraalkylurea which is now in the hydrochloric acid salt form. Use of tetraalkylurea as an acid acceptor, compared to prior art basic amines results in lesser contamination of the alkyl isocyanate due to a substantial reduction in formation of color bodies.

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3,644,462

## PREPARATION OF AROMATIC ISOCYANATES BY CATALYTIC CARBONYLATION OF NITRO COMPOUNDS

Eric Smith, Madison, and Ehrenfried H. Kober, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Mar. 12, 1969, Ser. No. 806,727

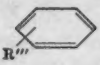
Int. Cl. C07c *119/04;* C07f *15/00*

U.S. Cl. 260—453 P 27 Claims

The process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst system comprising a halide of a noble metal and an amine composition. Useful amine compositions include compounds of the formula:

RR′R″N

wherein R, R′, and R″ are each selected from the group consisting of hydrogen, alkyl, cycloalkyl, aralkyl, and



and wherein not more than two of the R, R′ and R″ substituents are hydrogen. Preferred amines include tri-n-butyl amine, aniline, aniline-2-sulfonic acid, o-phenylene diamine, anthranilic acid, N-phenyl anthranilic acid, anthranilamide, o-aminophenol, o-aminobenzene thiol, benzyl amine, diphenyl amine, and triphenyl amine. The noble metal halide is preferably a halide of palladium, rhodium, iridium, rhenium, platinum, and mixtures thereof. The catalyst system may also include molybdenum trioxide or another metal oxide.

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3,644,463

## PRODUCTION OF ALIPHATIC 1,2-BISTHIOCYANATES

Richard Parke Welcher, Old Greenwich, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 15, 1968, Ser. No. 729,375

Int. Cl. C07c *161/02*

U.S. Cl. 260—454 5 Claims

Aliphatic 1,2-bisthiocyanates are produced by first preparing a solution of thiocyanogen in a water-insoluble liquid organic solvent such as toluene having an aqueous solution of an inorganic halide admixed therewith, drawing off the aqueous phase, adding an alpha-olefin or acetylene and reacting at a temperature below about 20° C. and preferably about 0°–10° C.

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3,644,464

## BIS(ALKENYL)[ETHYLENEBIS(OXYTRIMETHYLENE)]BIS(DITHIOCARBAMATE)

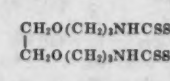
John Joseph D'Amico, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,290

Int. Cl. C07c *155/08*

U.S. Cl. 260—455 A 1 Claim

Compounds of the formula



where R is allyl, 2-chloroallyl, or cis- and trans-2,3-dichloroallyl for controlling foliage fungi.

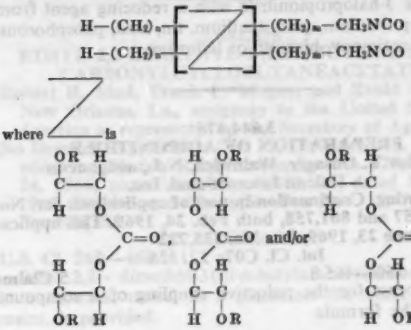
3,644,465

## ETHER CARBONATE DIISOCYANATES

Marwan R. Kamal, Dhahran, Saudi Arabia, and Robert C. Kuder, Excelsior, Minn., assignors to General Mills, Inc.

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,443
Int. Cl. C07c *119/04*; C08g *22/20*
U.S. Cl. 260—463 10 Claims

Ether carbonate diisocyanates of the formula



where *n* is 4 to 19, *m* is 0 to 15, the sum of *n* and *m* is 13 to 19 and R is a monovalent organic radical. Polymers prepared from such diisocyanates and organic compounds containing active hydrogens.

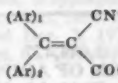
3,644,466

## α-CYANO-β,β-DIPHENYLACRYLIC ACID ESTERS

Albert F. Strobel, Delmar, and Sigmund C. Catino, Castleton, N.Y., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 121,820, July 5, 1961, which is a continuation-in-part of application Ser. No. 13,706, Mar. 9, 1960. This application May 6, 1966, Ser. No. 548,334
The portion of the term of the patent subsequent to Aug. 22, 1987, has been disclaimed
Int. Cl. C07c *121/40*; C08f *45/60*; C08g *51/60*
U.S. Cl. 260—465 9 Claims

The ultra-violet light absorbing compound of the formula:



wherein:

(1) $(Ar)_1$ and $(Ar)_2$ are aromatic carbocyclic nuclei devoid of nitro and nuclear bonded amine groups and selected from the class consisting of mono- and bicyclic nuclei, and

(2) Y is a substituted alkyl group selected from the class consisting of hydroxy alkyl, cyanoalkyl, haloalkyl, alkoxyalkyl, hydroxy alkoxyalkyl and carbalkoxyalkyl.

3,644,467

## METHOD OF REACTING HCN WITH UNSATURATED COMPOUND WITH DIMETHYL SULFOXIDE SOLVENT

Edgar Koberstein, Alzenau, and Wolfgang Nischk, Wesseling, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 613,941, Feb. 3, 1967. This application Nov. 26, 1968, Ser. No. 778,938
Claims priority, application Germany, Feb. 9, 1966, D 49,322
Int. Cl. C07c *121/04, 121/20, 121/40*
U.S. Cl. 260—465 D 9 Claims

Production of nitrile group containing organic compounds is accomplished by addition of hydrogen cyanide across an unsaturated carbon to carbon double bond of an organic compound in the presence of cyanide ions and in the presence of dimethyl sulfoxide. Preferably, the dimethyl sulfoxide is employed in a molar proportion of at least 0.3:1 with reference to the unsaturated compound.

3,644,468

## METHOD OF REACTING HCN WITH UNSATURATED COMPOUND WITH A PYRROLIDONE SOLVENT

Edgar Koberstein, Alzenau, and Wolfgang Nischk, Wesseling, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 613,941, Feb. 3, 1967. This application Nov. 26, 1968, Ser. No. 778,939
Claims priority, application Germany, Feb. 9, 1966, D 49,322
Int. Cl. C07c *121/04, 121/20, 121/40*
U.S. Cl. 260—465 D 13 claims

Production of nitrile group containing organic compounds is accomplished by addition of hydrogen cyanide across an unsaturated carbon to carbon double bond of an organic compound in the presence of cyanide ions and in the presence of pyrrolidone or a substituted pyrrolidone, preferably methyl pyrrolidone. The pyrrolidone compound is employed in a molar proportion of at least 0.3:1 with reference to the unsaturated compound.

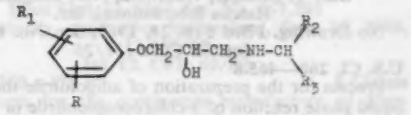
3,644,469

## 1-(CYANOPHENOXY)-2-HYDROXY-3-SEC.-ALKYLAMINO-PROPANES

Herbert Köppe, Werner Kummer, Helmut Stähle, and Karl Zeile, Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,874
Claims priority, application Germany, Dec. 18, 1967, B 95,902; Dec. 22, 1967, P 16 43 266.9
The portion of the term of the patent subsequent to Aug. 5, 1986, has been disclaimed
Int. Cl. C07c *121/52, 121/66*
U.S. Cl. 260—465 E 11 Claims

Racemic mixtures and optically active isomers of 1-phenoxy - 2 - hydroxy - 3 - sec. - alkylamino - propanes of the formula



wherein R is selected from the group consisting of

$$—(CH_2)_x—CN$$

$—(CH_2)_x—NH_2$ and $—(CH_2)_{x+1}—OH$ where *x* is 0, 1, 2 or 3, carboxyl, alkoxycarbonyl of 1 to 5 carbon atoms of the alkoxy part and alkenyloxy and alkynyloxy of 2 to 5 carbon atoms, $R_1$ is selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy of 1 to 5 carbon atoms, lower alkenyl of 2 to 5 carbon atoms, cyano and nitro and R and $R_1$ taken together may be methylenedioxy, $R_2$ is an alkyl of 1 to 5 carbon atoms and $R_3$ is alkyl of 2 to 6 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts having β-adrenolytic and blood pressure reducing properties.

3,644,470
**PROCESS FOR PRODUCING NITRILES**
Stanley D. Turk and Ralph P. Williams, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Jan. 14, 1969, Ser. No. 791,153
Int. Cl. C07c *121/02, 121/10, 121/12*
U.S. Cl. 260—465 B 7 Claims

Tetrahydrothiophene-1,1-dioxides (sulfolanes) are employed as reaction media for conversion of ammonium aromatic carboxylates to aromatic nitriles.

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3,644,471
**PRODUCTION OF 2,5-DICHLOROBENZONITRILE**
Eugene P. Di Bella, Rochelle Park, N.J., assignor to Tenneco Chemicals, Inc.
No Drawing. Filed Jan. 15, 1969, Ser. No. 791,485
Int. Cl. C07c *63/12, 121/52*
U.S. Cl. 260—465 G 3 Claims

2,5-dichlorobenzoic acid is prepared by heating a reaction mixture comprising 1,2,4-trichlorobenzene, cuprous cyanide, and a high-boiling tertiary amine such as quinoline at about 200°–240° C. to form a cyanation product comprising 2,5-dichlorobenzonitrile and hydrolyzing the cyanation product to obtain substantially pure 2,5-dichlorobenzoic acid.

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3,644,472
**PREPARATION OF UNSATURATED ALIPHATIC NITRILES**
Teo Paleologo, Cesare Reni, and Luigi Lugo, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy
Filed July 25, 1968, Ser. No. 747,733
Claims priority, application Italy, Aug. 1, 1967, 19,063/67
Int. Cl. C07c *121/02, 121/32*
U.S. Cl. 260—465.3 4 Claims

An olefin is oxidized in the presence of ammonia in a fluidized catalytic bed in a reactor having a specific structure operating in specific conditions. The structure comprises a plurality of heat-exchange tubes vertically extending through the catalytic bed, the tubes comprising external ribs or fins subdividing the bed into a plurality of vertically extending intercommunicating component beds in which a specific "real" height-to-diameter ratio is established in operation.

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3,644,473
**PRODUCTION OF ADIPONITRILE**
Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,758
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 4 Claims

Process for the preparation of adiponitrile through the liquid phase reaction of 3-chloropropionitrile or 3-bromopropionitrile with a reducing agent such as a complex containing a transition metal and a Lewis base or a transition metal carbonyl and a Lewis base.

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3,644,474
**PRODUCTION OF ADIPONITRILE**
Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,757
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 20 Claims

Process for the production of adiponitrile involving the use of a complex comprised of a transition metal and 3-chloropropionitrile or 3-bromopropionitrile to accomplish this preparation.

3,644,475
**PRODUCTION OF ADIPONITRILE**
Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.
No Drawing. Filed Mar. 27, 1969, Ser. No. 811,241
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 4 Claims

The process of the present invention provides for the preparation of adiponitrile through the liquid phase reaction of a 3-halopropionitrile with a reducing agent from the group titanium, gold, thallium, tin, lead, phosphorous, arsenic, antimony, bismuth or tellurium.

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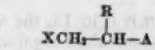
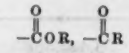
3,644,476
**PREPARATION OF ADIPONITRILE**
Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.
No Drawing. Continuation-in-part of applications Ser. No. 801,757 and 801,758, both Feb. 24, 1969. This application June 23, 1969, Ser. No. 835,722
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 5 Claims

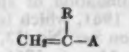
A process for the reductive coupling of a compound having the formula



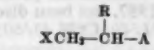
wherein X is Cl, Br, or I, R is H or lower alkyl, and A is —CN,



or —$CONR_2$, using as reducing agent zero valent iron or nickel or compounds thereof. The invention especially relates to an overall process for the production of linear dimers of compounds of the formula



by first hydrohalogenation to



followed by the reductive coupling.

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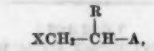
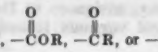
3,644,477
**PRODUCTION OF ADIPONITRILE**
Olav T. Onsager, Waldwick, N.J., assignor to Halcon International, Inc.
No Drawing. Continuation-in-part of applications Ser. No. 801,757, Feb. 24, 1969, Ser. No. 801,758, Feb. 24, 1969, and Ser. No. 835,722, June 23, 1969. This application Oct. 29, 1969, Ser. No. 872,395
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 13 Claims

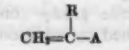
A process for the reductive coupling of a compound having the formula



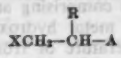
wherein X is Cl, Br, or I, R is H or lower alkyl, and A is



using as reducing agent a zero valent reducing metal or compound thereof in combination with a promoter salt. The invention especially relates to an overall process for the production of linear dimers of compounds of the formula



by first hydrohalogenation to



followed by the reductive coupling.

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3,644,478
ETHYL 2,2-DIMETHYL-3-(DI-n-BUTYLAMINO)-CARBONYLCYCLOBUTANEACETATE
Robert R. Mod, Frank C. Magne, and Evald L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Application Oct. 12, 1967, Ser. No. 683,060, which is a divsion of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126, dated Sept. 24, 1968. Divided and this application Nov. 13, 1969, Ser. No. 876,556
Int. Cl. C07c *93/18*
U.S. Cl. 260—468 R 1 Claim

Ethyl 2,2 - dimethyl-3(di-n-butylamino)carbonylcyclobutaneacetate, useful as a plasticizer for vinyl chloride resins, is provided.

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3,644,479
1-INDANCARBOXYLIC ACIDS AND DERIVATIVES
Peter Frederick Juby and Thomas William Hudyma, Dewitt, and Richard Anthony Partyka, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed Feb. 9, 1970, Ser. No. 9,963
Int. Cl. C07c *69/76*
U.S. Cl. 260—469 5 Claims

5-phenyl-1-indancarboxylic acids are useful anti-inflammatory agents in the treatment of inflammatory diseases in animals, including man.

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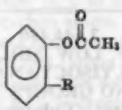
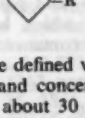
3,644,480
2-SUBSTITUTED BENZENE ACETATE MANUFACTURE
Mahmoud S. Kablaoui, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Dec. 3, 1970, Ser. No. 94,996
Int. Cl. C07c *69/14*
U.S. Cl. 260—473 R 9 Claims

A method of preparing 2-substituted benzene acetate of the formula:



where R is a monovalent radical of up to 20 carbons selected from the group consisting of alkyl, cycloalkyl and $-CH_2COO(CH_2)_xCH_3$ where $x$ is an integer from 0 to 17 comprising contacting 2-substituted cyclohexanone of the formula:



where R is as heretofore defined with a mixture of acetic anhydride, acetic acid and concentrated sulfuric acid at a temperature between about 30 and 140° C. utilizing a mole ratio of sulfuric acid to cyclohexanone of at least 2:1 and a mole ratio of acetic acid to acetic anhydride of at least about 1:1 and recovering said 2-substituted benzene acetate. The 2-substituted benzene acetate product can be readily converted to the corresponding 2-substituted phenol by hydrolysis.

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3,644,481
PLICATIC ACID ESTERS
John Howard and Terence D. McIntosh, Vancouver, British Columbia, Canada, assignors to ITT Rayonier Incorporated
No Drawing. Continuation-in-part of application Ser. No. 687,092, Dec. 1, 1967. This application Mar. 6, 1968, Ser. No. 710,775
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 F 6 Claims

New compositions of matter comprising alkyl and aryl esters of plicatic acid, and the use of these esters as antioxidants for fats and oils, are disclosed.

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3,644,482
(4-HYDROXY-5-ALKYLPHENYL) ALKANOIC ACID ESTERS OF POLYOLS
Martin Dexter, Briarcliff Manor, John D. Spivack, Spring Valley, and David H. Steinberg, Bronx, N.Y., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 359,460, Apr. 13, 1964, which is a continuation-in-part of application Ser. No. 276,192, Apr. 29, 1963, which is a continuation-in-part of application Ser. No. 164,618, Jan. 5, 1962, which in turn is a continuation-in-part of application Ser. No. 148,738, Oct. 30, 1961. This application Sept. 26, 1969, Ser. No. 861,475
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 R 21 Claims

Esters derived from (4-hydroxy-5-alkylphenyl)-alkanoic acids, optionally substituted in the 2- or 3-position of the phenyl ring by a second alkyl group, and alkane polyols are stabilizers of organic material normally subject to oxidative deterioration. They are prepared by conventional esterification techniques. Typical embodiments are ethylene glycol bis[3 - (3,5-di-t-butyl-4-hydroxyphenyl) propionate] and pentaerythritol tetrakis[3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate].

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3,644,483
CONTINUOUS MANUFACTURE OF FIBER-FORMING POLYESTERS
Wolfgang Griehl, Chur, Grisons, Switzerland, and Wolf Dieter Hahn and Joachim Plenz, Frankfurt am Main, Germany, assignors to Inventa A.G. fur Forschung und Patentverwertung, Zurich, Switzerland
Filed Sept. 12, 1967, Ser. No. 667,285
Claims priority, application Switzerland, Sept. 16, 1966, 13,427/66
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 P 8 Claims

A process for the continuous manufacture of fiber-forming polyesters or copolyesters from dicarboxylic acids and glycols wherein the formation of undesirable diglycols is suppressed. The materials are directly esterified by introducing them into a tubular reaction zone at 150–250° wherein a considerable portion esterifies. This product then is introduced into a precondensate of the same ingredients having a degree of polycondensation of 2–6, at a vacuum of 25–100 torr. The water of reaction and free glycol immediately evaporate under the influence of the vacuum. As soon as this reaction product attains a degree of polycondensation of 2–6, a portion thereof continuously is withdrawn in proportion to new acid introduced. The condensate withdrawn then is polycondensed in the conventional manner to a fiber-forming polyester.

In a preferred embodiment, a part of the glycol is withheld and subjected to a glycolysis with the precondensate, prior to its entry into the reaction.

3,644,484

## PRODUCTION OF BIS-HYDROXYALKYL ESTERS OF BENZENE DICARBOXYLIC ACIDS

Enrique R. Witt and Donald R. Larkin, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Apr. 2, 1968, Ser. No. 718,226
Int. Cl. C07c *69/80, 69/82*
U.S. Cl. 260—475 P 10 Claims

Process for the production of bis-hydroxyalkyl phthalates by reacting an alkylene oxide with a benzene dicarboxylic acid in the presence of a catalyst and in an alkyl-substituted dioxolane reaction medium. For example ethylene oxide is reacted with terephthalic acid in a 2-ethyl, 2-methyl dioxolane reaction medium using a tertiary amine catalyst so as to produce bis(2-hydroxyethyl) terephthalate.

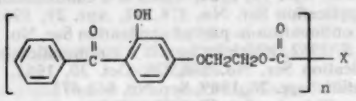
3,644,485

## 2-HYDROXY-4-(2 - HYDROXYETHOXY) BENZOPHENONE ESTERS AND THEIR USE AS STABILIZERS

Gerald R. Lappin and Wayne V. McConnell, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,071
Int. Cl. C07c *69/76*
U.S. Cl. 260—475 P 1 Claim

Compositions of matter of the structure



wherein

$n$=2, 3, or 4

X=polyvalent organic radical derived from an aliphatic, cycloaliphatic or aromatic polybasic acid

and their use as stabilizers for various polymeric materials.

3,644,486

## PROCESS FOR THE MANUFACTURE OF OXACYLATION PRODUCTS AND OPTIONALLY HYDROXYLATION PRODUCTS OF CONDENSED AROMATIC COMPOUNDS

Manfred Boldt and Hans-Jurgen Arpe, Fischbach, Taunus, and Lothar Hornig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 19, 1968, Ser. No. 760,964
Claims priority, application Germany, Sept. 23, 1967, F 53,564
Int. Cl. C07c *69/14, 69/24, 69/62*
U.S. Cl. 260—479 R 6 Claims

Catalytic manufacture of oxacylation products and optionally hydroxylation products of condensed aromatic cmpounds from condensed aromatic compounds and saturated aliphatic or cycloaliphatic carboxylic acids and molecular oxygen in the presence of a noble metal of sub-group 8 of the Mendeleeff Periodic Table or compounds thereof, the stable valency of this noble metal in said compounds being at most 4.

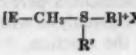
3,644,487

## SULFUR YLID PRODUCTION

George B. Payne, Berkeley, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed May 19, 1966, Ser. No. 551,233
Int. Cl. C07c *69/52*
U.S. Cl. 260—481 9 Claims

Method of producing sulfur ylids by contacting a sulfonium halide of the formula



wherein $X^-$ is a halide ion, R and R′ independently are lower alkyl and E is a carbalkoxy group with a dehydrohalogenating solution comprising an aqueous solution of a mixture of alkali metal hydroxide and alkali metal carbonate at a temperature of from about −10° C. to about 50° C.

3,644,488

## SUBSTITUTED β,β′-THIO DIETHYL SULFONES

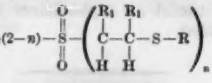
Albert C. Perrino, Cravston, and Michael G. Israel, Bristol, R.I., assignors to I.C.I. Organics Inc., Providence, R.I.

No Drawing. Original application Oct. 26, 1966, Ser. No. 589,529, now Patent No. 3,479,408. Divided and this application Apr. 10, 1969, Ser. No. 815,202
Int. Cl. C07c *149/20*
U.S. Cl. 260—481 R 6 Claims

A novel class of sulfones useful as stabilizers in polyolefin compositions and polyolefin compositions made from the same. The sulfones have the formula

$$R_2(2\text{-}n)SO_2(CR_1HCR_1HS(CH_2)_mCOOR_3)_n$$

$$R_2(2\text{-}n)SO_2(CR_1HCR_1HS(CH_2)_{m2}OCOR)_n \text{ or}$$



3,644,489

## N,N-DICHLOROAMINE SALTS AND THEIR PREPARATION

Julius J. Fuchs, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 745,974, July 19, 1968, now Patent No. 3,530,162, which is a continuation-in-part of application Ser. No. 661,491, July 11, 1967, which in turn is a continuation-in-part of application Ser. No. 397,022, Sept. 16, 1964, now Patent No. 3,346,554. This application Jan. 7, 1970, Ser. No. 1,322
Int. Cl. C07c *101/10, 101/20, 101/30*
U.S. Cl. 260—482 P 2 Claims

N,N-dichloroamine compounds, such as the sodium salt of 1 - (N,N-dichloroamino)cyclohexane carboxylic acid, are prepared by chlorinating the corresponding amine in the presence of water and a water immisible inert organic solvent such as carbon tetrachloride while maintaining an approximately neutral pH, through addition of a strongly basic acid acceptor such as sodium hydroxide. The N,N-dichloroamine compounds thus prepared are useful in preparing symmetrical azo compounds such as the di-sodium salt of azo-bis(cyclohexanecarboxylic acid).

3,644,490

## PREPARATION OF LOW MOLECULAR WEIGHT MONO- AND POLYISOCYANATES CONTAINING TERTIARY AMINO GROUPS

Hans-Georg Schmelzer, Cologne-Stammheim, Gunter Gertel, Cologne-Flittard, Eberhart Degener, Leverkusen, and Manfred Dahm, Bergisch-Neukirchen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 20, 1968, Ser. No. 714,446
Claims priority, application Germany, Mar. 29, 1967, F 51,966
Int. Cl. C07c *119/04, 125/06*
U.S. Cl. 260—482 B 5 Claims

A process for the preparation of non-volatile, low molecular weight mono- and polyisocyanates containing tertiary amino groups, which is characterized in that tertiary amines which contain one or more hydroxyl groups and/or one or more secondary amino groups and/or one to three primary amino groups are reacted in known manner with an excess of an aliphatic, cycloaliphatic or araliphatic diisocyanate, at least three mols of diisocyanate being used for one of these groups which react with isocyanates, and the excess diisocyanate is

completely removed by continuous flow distillation and/or thin layer distillation under reduced pressure at temperatures of 80 to 200° C.

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3,644,491

## SYNTHESIS OF 2-UREIDOOXYPROPIONIC ACID ESTERS

Charles D. Adams, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 29, 1968, Ser. No. 779,914
Int. Cl. C07c *127/14*
U.S. Cl. 260—482 R 7 Claims

Esters of 2-ureidooxypropionic acid, such as the methyl ester, are prepared by the steps of

(a) forming acetohydroxamic acid by reaction of methyl acetate with an acid salt of hydroxylamine and sodium methoxide in methanol;
(b) forming methyl 2-acetamidooxypropionate by reacting the product of (a) with sodium methoxide and then methyl 2-bromopropionate;
(c) forming methyl 2-aminooxypropionate hydrochloride by reacting the product of (b) with anhydrous hydrogen chloride, filtering the reaction mixture and concentrating the filtrate;
(d) forming methyl 2-ureidooxypropionate by dissolving the concentrated filtrate in water and then reacting it with an alkali metal cyanate.

Ethyl 2-ureidooxypropionate is formed by the same four-step reaction wherein ethanol replaces methanol, sodium ethoxide replaces sodium methoxide, ethyl acetate replaces methyl acetate, and ethyl 2-bromopropionate replaces methyl 2-bromopropionate. These products are plant growth regulants as disclosed in U.S. Pat. No. 3,282,987.

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3,644,492

## ESTERS OF HEXAFLUOROPROPYLENE OXIDE POLYMER ACIDS AND POLYALKYLENE GLYCOLS

Philip Lee Bartlett, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1969, Ser. No. 846,238
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 11 Claims

Esters derived from hexafluoropropylene oxide polymer acids and polyalkylene glycols having the formula:

$$R_fO[CF(CF_3)CF_2O]_nCF(CF_3)COO—R^1—O(CHR^2CHR^3O)_yR^4$$

wherein $R_f$ is a perfluoroalkyl radical having 1 to 8 carbon atoms, $n$ is an integer of 0 to 100, $R^1$ is an alkylene radical having 2 to 12 carbon atoms, $R^2$ is hydrogen or an alkyl radical having 1 to 4 carbon atoms, $R^3$ is hydrogen or an alkyl radical having 1 to 4 carbon atoms, at least one of $R^2$ and $R^3$ in each repeating unit being hydrogen, $y$ is an integer of 1 to 60, and $R^4$ is hydrogen or an alkyl radical having 1 to 4 carbon atoms. These esters function efficiently as surfactants and emulsifying agents.

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3,644,493

## 2,3-DIHALOALKYL COMPOUNDS

James C. Wygant, Creve Coeur, Richard M. Anderson, St. Louis, and Erhard J. Prill, Des Peres, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Division of application Ser. No. 437,258, Mar. 4, 1965, now Patent No. 3,317,568, which is a continuation-in-part of application Ser. No. 405,819, Oct. 22, 1964, which in turn is a continuation-in-part of applications Ser. No. 248,853, Jan. 2, 1963, and Ser. No. 267,783, Mar. 25, 1963, now Patent No. 3,236,659. This application July 15, 1966, Ser. No. 620,189
Int. Cl. C07c *69/34, 69/36, 69/40*
U.S. Cl. 260—485 H 4 Claims

As new compounds, the 2,3-dibromopropyl esters of (1) alkane polycarboxylic acids having from 1 to 14 carbon atoms in the alkane and from 2 to 5 carboxy groups and (2) oxalic acid. The said esters are flame-retardants for polymer systems.

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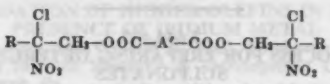
3,644,494

## 2-NITRO-2-CHLORO-n-ALKYL ESTERS

Milton B. Frankel, Menlo Park, Marvin H. Gold, Sacramento, and Henry J. Marcus, West Covina, Calif., assignors to Aerojet-General Corporation, Azusa, Calif.

No Drawing. Original application July 30, 1964, Ser. No. 386,379, now Patent No. 3,440,282, dated Apr. 22, 1969. Divided and this application Aug. 19, 1968, Ser. No. 798,203
Int. Cl. C07c *79/40*
U.S. Cl. 260—485 H 2 Claims

Compounds of the formula



wherein R is a lower alkyl radical and A′ is a lower alkylene radical containing one or more nitro groups.

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3,644,495

## PRODUCTION OF HALOGENATED ESTERS AND UNSATURATED ESTERS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillip. Petroleum Company

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,750
Int. Cl. C07c *67/00*; C07d *7/04*
U.S. Cl. 260—491 11 Claims

Alkenyl alkanoates and 3-haloalkyl alkanoates are produced by reacting 1-alkenes, hydrogen halides, paraformaldehyde, and nitriles at temperatures in the range of —80 to 0° C. Cycloalkenylmethyl alkanoates and 2-halocycloalkylmethyl alkanoates are produced by reacting cycloalkenes, hydrogen halides, paraformaldehyde, and nitriles at temperatures in the range of —80 to 0° C.

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3,644,496

## PRODUCTION OF ALKENYL ALKANOATES AND 3-HALOALKYL ALKANOATES

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,749
Int. Cl. C07c *67/00*
U.S. Cl. 260—494 8 Claims

Alkenyl alkanoates and 3-haloalkyl alkanoates are produced by reacting a hydrogen halide, an alkene, paraformaldehyde and an alkanoic anhydride at a temperature in the range of —80 to —30° C.

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3,644,497

## CONVERSION OF ETHYLENICALLY UNSATURATED COMPOUNDS USING HETEROPOLY-MOLYBDIC AND HETEROPOLYTUNGSTIC ACIDS AS CATALYSTS

Frank G. Mesich, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,817
Int. Cl. C07c *69/14, 31/10*
U.S. Cl. 260—497 R 17 Claims

Process for the conversion of ethylenically unsaturated compounds to esters and alcohols wherein the ethylenically unsaturated compound and a carboxylic acid are reacted in the presence of a free heteropolyacid of molybdenum or tungsten. Esters are the main product when anhydrous conditions are used while a mixture of esters and alcohols may be produced when water is present.

3,644,498
**YELLOW DYE FORMING COUPLERS FOR COLOR PHOTOGRAPHY**
Anthony Loria, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Application July 6, 1965, Ser. No. 469,887, now Patent No. 3,408,194, dated Oct. 29, 1968, which is a continuation-in-part of application Ser. No. 312,894, Oct. 1, 1963. Divided and this application June 26, 1967, Ser. No. 658,971
Int. Cl. C07c *143/56*
U.S. Cl. 260—507 R 8 Claims
Open chain reactive methylene two-equivalent yellow-forming couplers in which one of the hydrogen atoms of the active methylene group is replaced with a cyclooxy group are used to advantage in color developer solutions and in light-sensitive photographic emulsion layers of forming yellow dye images in color photography.

3,644,499
**PROCESS FOR PREPARING DETERGENT SULFONATES**
Clarence R. Murphy, Allison Park, Anatoli Onopchenko, Pittsburgh, and John M. Piatt and Richard Seekircher, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Dec. 17, 1968, Ser. No. 784,485
Int. Cl. C07c *143/02, 143/04*
U.S. Cl. 260—513 B 7 Claims
A process for stabilizing the pH of sulfonates obtained from the reaction of an olefinic compound with an alkali bisulfite which involves contacting an aqueous slurry of such sulfonates containing an alkaline compound with oxygen.

3,644,500
**NAPHTHOIC ACID DERIVATIVES**
Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Aug. 19, 1970, Ser. No. 65,322
Int. Cl. C07c *61/36*
U.S. Cl. 260—514 R 1 Claim
6-oxo-1-a-naphthoic acid derivatives useful as anti-inflammatory agents.

3,644,501
**PROCESS FOR PRODUCING FLUORINATED ACIDS**
Joseph D. Park, Boulder, Colo., and Bruce T. Nakata, East Palo Alto, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed May 28, 1968, Ser. No. 732,557
Int. Cl. C07f *1/02*; C07c *61/16, 51/00*
U.S. Cl. 260—514 R 2 Claims
Fluoroaliphatic vinylic carboxyl-containing compounds are prepared by the following steps: first, reacting in gas phase hydrogen bromide with a volatile fluoroaliphatic compound containing at least one vinylic chlorine atom in which nondoubly bonded carbon atoms are substituted only by fluorine and fluoroalkyl groups containing from one to six carbon atoms, in the presence of a metal salt-active carbon catalyst, thereby effecting the replacement of at least one vinylic chlorine atom by bromine; second, reacting a brominated product of step (1) with alkali metal iodide, the reactants being dissolved in dimethylformamide, thereby effecting a substitution of at least one vinylic bromine atom by iodine; third, reacting an iodide resulting from step (2) with a lithium alkyl to produce an organolithium intermediate compound and subsequently treating said intermediate compound with carbon dioxide to produce a lithium salt which hydrolyzes to a carboxylic acid. The carboxylic acids of the invention are much stronger acids than the corresponding saturated structures and may be converted into useful simple derivatives.

3,644,502
**PROSTAGLANDIN SYNTHESIS**
Robert B. Morin, Douglas O. Spry, and Kenneth L. Hauser, Indianapolis, and Richard A. Mueller, Bloomington, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Dec. 16, 1968, Ser. No. 784,225
Int. Cl. C07c *61/36*
U.S. Cl. 260—514 R 1 Claim
Prostaglandins are synthesized from o-methoxyphenylacetic acid by introduction of a proper acid side chain, conversion of the aromatic nucleus to the cyclopentane nucleus, and introduction of the second side chain. Novel compounds having a high level of biological activity are disclosed.

3,644,503
**dl-DECAHYDRO-8β-(t-BUTOXY OR BENZYLOXY)-8aβ-LOWER ALKYL - 2-OXO-PHENANTHRENE-1-ALKANOIC ACIDS**
Marinus Los, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Original application June 4, 1964, Ser. No. 372,690, now Patent No. 3,446,849, dated May 27, 1969. Divided and this application Jan. 6, 1969, Ser. No. 789,365
Int. Cl. C07c *61/32*
U.S. Cl. 260—514.5 2 Claims
This disclosure describes compounds of the class of dl-2,3,4,4aβ,4bα,5,6,7,8,8a-decahydro-8aβ - lower alkyl - 8β-(t-butoxy or benzyloxy) - 2 - oxo - 1 - substituted-phenanthrenes useful as intermediates in the synthesis of biologically active steroid moieties.

3,644,504
**TRANSFORMATION OF AROMATIC CARBOXYLIC ACID SALTS**
Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Mar. 10, 1969, Ser. No. 805,892
Int. Cl. C07c *51/00, 51/52*
U.S. Cl. 260—515 P 4 Claims
Increase in yield of aromatic polycarboxylic acid salts is achieved by carrying the transformation process for the formation of same in an atomsphere consisting essentially of carbon monoxide and in the presence of a small amount of water and a catalyst adjuvant of the formula ROH or ROM, wherein R is alkyl, aryl, cycloalkyl radical or combination thereof having from 1 to 15 carbon atoms therein and M is an alkali metal.

3,644,505
**PERFUME COMPOSITION INCLUDING TETRAHYDROPYRANYL ETHER OF 3-ENDO-METHYL-3 - EXO(4' - METHYL - 5 - HYDROXYPENTYL) NORCAMPHOR**
Wayne I. Fanta, Colerain Township, Hamilton County, and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Original application Mar. 29, 1968, Ser. No. 717,384. Divided and this application Apr. 6, 1970, Ser. No. 26,132
Int. Cl. C11b *9/00*; C11d *1/00*
U.S. Cl. 252—522 1 Claim
The novel odorant compounds, 2-methyl-5-bromopentyl tetrahydropranyl ether and tetrahydropyranyl ether of 3 - endo - methyl-3-exo-(4'-methyl-5'-hydroxypentyl)norcamphor and a process for preparing 2-methyl-5-bromopentyl tetrahydropyranyl ether, tetrahydropyranyl ether of 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl) norcamphor and 3 - endo-methyl-3-oxo(4'-methyl-5'-hydroxypentyl)norcamphor comprising the steps of: (1) esterifying 2-methyl-4-pentenol; (2) hydrobrominating the ester in the presence of a free radical catalyst; (3) reducing the hydrobrominated ester to 2-methyl-5-bromopentanol; (4) etherifying 2-methyl-5-bromopentanol with

dihydropyran to obtain the novel compound, 2-methyl-5-bromopentyl tetrahydropyranyl ether; (5) alkylating 3-methylnorcamphor with the 2 - methyl - 5-bromopentyl tetrahydropyranyl ether to obtain the novel compound, tetrahydropyranyl ether of 3 - endo - methyl - 3-oxo(4'-methyl - 5'-hydroxypentyl)norcamphor; and (6) treating tetrahydropyranyl ether of 3 - endo - methyl - 3-oxo(4'-methyl - 5' - hydroxypentyl)norcamphor with p-toluenesulfonic acid or hydrochloric acid to obtain 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor.

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3,644,506

## PREPARATION OF AROMATIC CARBOXYLIC ACIDS

**Roger C. Williamson, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed Mar. 28, 1969, Ser. No. 811,660**
**Int. Cl. C07c *63/02***
**U.S. Cl. 260—524 R** **15 Claims**

The improvement in a process wherein a mixture containing in excess of about 13 percent by weight of an aromatic compound, in which the aromatic group carries at least one methyl substituent, is subjected to oxidation with molecular oxygen in an inert reaction medium in the presence of a cobalt, nickel, chromium or manganese catalyst to obtain the corresponding aromatic carboxylic acid, which involves controlling the amount of water in the initial reaction mixture so that it is below about 0.9 percent by weight.

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3,644,507

## THERMAL PURIFICATION OF TEREPHTHALIC ACID USING IODINE OR BROMINE CATALYSTS

**Enrique R. Witt and Jorge A. Blay, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.**

**No Drawing. Filed Nov. 29, 1968, Ser. No. 780,265**
**Int. Cl. C07c *51/42***
**U.S. Cl. 260—525** **20 Claims**

A process for the purification of crude terephthalic acid (TPA) by heating the crude TPA and a liquid medium in the presence of an iodine or bromine catalyst to an elevated temperature followed by cooling of the heated mixture so as to crystallize the TPA. The heating required is to a temperature above about 275° C. and should preferably be to a temperature such that no TPA remains as a solid.

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3,644,508

## PROCESS FOR THE RECOVERY OF GLYOXYLIC ACID

**Robert H. Callighan, Penn Hills Township, Allegheny County, and Philip X. Masciantonio, Penn Township, Westmoreland County, Pa., assignors to United States Steel Corporation**

**No Drawing. Filed July 23, 1969, Ser. No. 844,160**
**Int. Cl. C07c *51/42***
**U.S. Cl. 260—526 R** **5 Claims**

Glyoxylic acid is recovered from the solution resulting when the hydroperoxide is formed by reacting maleic acid with ozone in a solvent. The hydroperoxide in the solution has its free oxygen reduced with sulphur dioxide to form sulphur trioxide. The sulphur trioxide is then precipitated by reaction with an alkaline earth metal oxide or other precipitating agent and the glyoxylic acid product is then easily separated from the precipitate.

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3,644,509

## OXIDATION OF UNSATURATED ALDEHYDES TO THE CORRESPONDING ACIDS

**George C. Allen, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.**

**No Drawing. Filed Feb. 3, 1969, Ser. No. 796,651**
**Int. Cl. C07c *57/04***
**U.S. Cl. 260—530 N** **16 Claims**

Process for the conversion of unsaturated aldehydes to the corresponding unsaturated carboxylic acids, e.g. acrolein to acrylic acid, by reacting the unsaturated aldehyde with oxygen in the presence of a catalyst of the empirical formula $Mo_aV_bW_cMn_dO_e$.

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3,644,510

## PROPYLENE OXIDATION IN THE PRESENCE OF IRIDIUM METAL

**Noel W. Cant and William K. Hall, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed Nov. 25, 1968, Ser. No. 778,805**
**Int. Cl. C07c *53/08***
**U.S. Cl. 260—533 R** **8 Claims**

Propylene is oxidized with oxygen to acetic acid, acrolein, etc. by oxidation in the contact presence of iridium metal.

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3,644,511

## OXIDATION OF HIGHER OLEFINS IN THE PRESENCE OF IRIDIUM METAL

**Noel W. Cant and William K. Hall, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Continuation-in-part of application Ser. No. 778,805, Nov. 25, 1968. This application Sept. 16, 1969, Ser. No. 858,514**
**Int. Cl. C07c *45/04, 53/08***
**U.S. Cl. 260—533 R** **11 Claims**

An olefin having from three to eight carbon atoms per molecule, such as propylene, is oxidized with oxygen to fatty acids and other oxygenated compounds, such as acetic acid, acrolein, etc., by oxidation of the olefin in the contact presence of iridium metal.

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3,644,512

## PROCESS FOR CONVERTING BUTANE TO ACETIC ACID

**Anatoli Onopchenko, Monroeville, Johann G. D. Schulz, Pittsburgh, and Richard Seekircher, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed Oct. 10, 1969, Ser. No. 865,495**
**Int. Cl. C07c *53/08***
**U.S. Cl. 260—533 R** **5 Claims**

A process for converting butane to acetic acid which comprises subjecting butane to reaction with molecular oxygen in acetic acid in the presence of a cobalt compound soluble in the reaction mixture and a xylene, such as para xylene.

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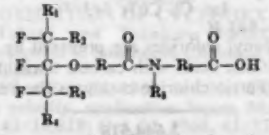
3,644,513

## POLYFLUOROISOALKOXYALKYL AMIDO CARBOXYLIC ACIDS AND SALTS THEREOF

**Richard F. Sweeney, Dover, Alson K. Price, Morristown, and Aziz U. Khan, Elizabeth, N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Apr. 23, 1969, Ser. No. 818,825**
**Int. Cl. C07c *101/10*; C07f *1/00***
**U.S. Cl. 260—534 E** **27 Claims**

Polyfluoroisoalkoxyalkyl amido carboxylic acids of the formula:



wherein $R_1$–$R_4$ are each independently selected from the group consisting of F, Cl, alkyl and haloalkyl groups in which the halogen atoms are Cl or F; $R_1$ and $R_4$ when taken together are alkylene or haloalkylene groups which form, with the carbon chain therebetween, a cyclic structure; R is a member selected from the group consisting of alkylene and haloalkylene; $R_5$ is a member selected from the group consisting of hydrogen and alkyl, and $R_6$ is a member selected from the group consisting of alkylene,

monohydroxyalkylene and carboxyalkylene radicals; and salts thereof containing a cation selected from the group consisting of Li, Na, K, Rb, Cs, Ca, Ba, Mg, Zn, Hg, Al, Cr, Sn, Fe, Ag, Cu, Co, Zr, Pb, Mn, or a radical selected from morpholino, ammonium or an alkyl or hydroxyalkyl substituted ammonium radical. Preparation by reacting correspoinding polyfluoroisoalkoxyalkyl amido carboxylic acid fluorides or halosulfates with amino acids. The novel compounds are useful as emulsifying agents, leveling agents, oil, stain and water repellent agents, additives to dry powder fire extinguishing compositions and as intermediates to valuable oil, stain and water repellent agents.

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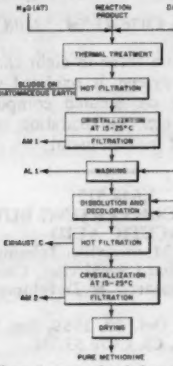
3,644,514

**PROCESS FOR SEPARATING PURE METHIONINE FROM THE HYDROLYSIS PRODUCT OF ITS NITRILE**

**Mario Bornengo, Novara, and Pietro Pasquino, Vercelli, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**Filed Nov. 17, 1969, Ser. No. 877,171**
**Claims priority, application Italy, Nov. 18, 1968, 23,877/68**
**Int. Cl. C07c *149/20, 149/24***
**U.S. Cl. 260—534 S** **4 Claims**




There is disclosed a method for separating pure methionine from mixtures comprising it, and more particularly from the crude reaction product obtained by sulphuric acid hydrolysis of 2-amino-4-methylmercapto-butyronitrile followed by neutralization of the crude hydrolysis product by means of ammonia. A sufficient quantity of water is added to the neutralized mass to completely dissolve the methionine, the solution is heated at 95° C. to 135° C. under pressure, the insoluble sludges are separated under heating, and the purified solution is cooled to effect crystallization of methionine having a titer higher than 99%.

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3,644,515

**BENZENESULFONYL CHLORIDE PROCESS**

**Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**No Drawing. Filed May 1, 1968, Ser. No. 725,949**
**Int. Cl. C07c *143/70***
**U.S. Cl. 260—543 R** **10 Claims**

Benzenesulfonyl chlorides are prepared by the reaction of benzenesulfonic acids with carbon tetrachloride in the liquid phase. Ferric chloride catalyzes the reaction.

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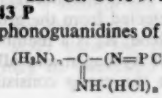
3,644,516

**TRICHLOROPHOSPHONOGUANIDINES**

**Fawzy G. Sherif, Cherry Hill, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed July 31, 1969, Ser. No. 846,581**
**Int. Cl. C07f *9/25***
**U.S. Cl. 260—543 P** **2 Claims**

Trichlorophosphonoguanidines of the general formula



in which $n$=0 or 1, which are useful for extending molecules having active hydroxyl or amine (NH) groups, as phosphorylating intermediates to prepare amidophosphoric esters and the like.

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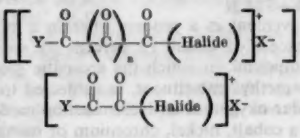
3,644,517

**PHOSPHINE SUBSTITUTED OXALYL CHLORIDES**

**Laszlo Joseph Bollyky and Robert Henry Whitman, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Original application Sept. 13, 1967, Ser. No. 667,371, now Patent No. 3,442,813, dated May 6, 1969. Divided and this application Nov. 27, 1968, Ser. No. 779,646**
**Int. Cl. C07f *9/50***
**U.S. Cl. 260—544 M** **3 Claims**

A chemiluminescent reactant complex formed by the reaction of a polycarbonyl halide and a Lewis base, having the following formula:



where X is a halide ion and Y is a triphenylphosphine or a trialkylphosphine group.

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3,644,518

**PROCESS FOR THE PRODUCTION OF NAPHTHAMIDE DERIVATIVES**

**Makoto Yoshida, 15 Nakajima, Kanagawa-ken, Odawara-shi, Japan, and Akio Okumura, 1247 Yoshihama, Yogawara-machi, Kanagawa-ken, Japan**

**No Drawing. Continuation-in-part of application Ser. No. 458,403, May 24, 1965. This application Aug. 1, 1968, Ser. No. 749,340**
**Int. Cl. C07c *103/30***
**U.S. Cl. 260—559** **11 Claims**

A process for preparing 1-hydroxy-2-naphthamido derivatives, from the corresponding nitrile and a 1-hydroxy-2-naphthoic acid aryl ester in the presence of a reduction catalyst, in a single step with a high yield.

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3,644,519

**BIS(2-FLUORO-2,2-DINITROETHYL AMIDES**

**Horst G. Adolph, Beltsville, and Mortimer J. Kamlet, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Navy**

**No Drawing. Filed Jan. 2, 1969, Ser. No. 790,509**
**Int. Cl. C07c *103/30***
**U.S. Cl. 260—561 K** **2 Claims**

Amides of 2-fluoro-2,2-dinitroethylamine formed by reacting 2-fluoro-2,2-dinitroethylamine with a mono- or bifunctional acid halide in the presence of pyridine.

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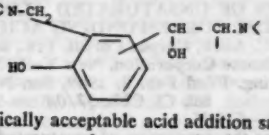
3,644,520

**PHENYLETHANOLAMINES**

**David Hartley, Lawrence H. C. Lunts, and David Jack, London, England, assignors to Allen & Hanburys Limited, London, England**

**No Drawing. Filed Dec. 10, 1968, Ser. No. 782,742**
**Claims priority, application Great Britain, Dec. 21, 1967, 58,012/67**
**Int. Cl. C07c *103/38, 103/12***
**U.S. Cl. 260—562 A** **8 Claims**

Compounds having the skeletal structure



and physiologically acceptable acid addition salts thereof. The disclosed compounds possess stimulant or blocking actions on adrenergic-receptors.

3,644,521

## N-(ALPHA, ALPHA-DIMETHYLBENZYL)-ALPHA, ALPHA-(DIMETHYLALKYLAMIDES)

George A. Buntin, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Application July 1, 1968, Ser. No. 741,253, now Patent No. 3,498,781, which is a continuation-in-part of application Ser. No. 691,941, Dec. 20, 1967. Divided and this application Dec. 12, 1969, Ser. No. 889,812

Int. Cl. C07c *103/34*

U.S. Cl. 260—562 R 2 Claims

Disclosed are the compounds N-(alpha,alpha-dimethylbenzyl) - 2,2 - dimethylpropionamide, N-(alpha,alpha-dimethylbenzyl) - 2,2 - dimethylbutyramide and N-(alpha, alpha-dimethylbenzyl) - 2,2 - dimethylvaleramide, and a general reaction by which they are made. The compounds have utility as herbicides.

3,644,522

## CATALYTIC HYDROGENATION OF NITROGEN CONTAINING COMPOUNDS OVER SUPPORTED RUTHENIUM CATALYSTS

Loren D. Brake and Alvin B. Stiles, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 691,954, Dec. 20, 1967, which is a continuation-in-part of application Ser. No. 588,011, Oct. 20, 1966, which in turn is a continuation-in-part of application Ser. No. 516,108, Dec. 23, 1965. This application is also a continuation-in-part of application Ser. No. 588,011, Oct. 20, 1966, which is a continuation-in-part of application Ser. No. 516,108, Dec. 23, 1965. This application is also a continuation-in-part of application Ser. No. 691,979, Dec. 20, 1967, which is a continuation-in-part of application Ser. No. 587,982, Oct. 20, 1966, which in turn is a continuation-in-part of application Ser. No. 516,140, Dec. 23, 1965. This application is also a continuation-in-part of application Ser. No. 587,982, Oct. 20, 1966, which is a continuation-in-part of application Ser. No. 516,140, Dec. 23, 1965. This application Apr. 4, 1969, Ser. No. 813,752

Int. Cl. C07c *85/14*

U.S. Cl. 260—563 D 13 Claims

Organic aromatic nitrogen containing compounds, such as p-phenylenediamine or 4,4'-methylenedianiline, can be hydrogenated by admixing the compound with hydrogen at a hydrogen partial pressure of at least 200 p.s.i., a total pressure of from 200 p.s.i. to 15,000 p.s.i., a temperature in the range of from 100° C. to 300° C., in the presence of from 0% to 200% by weight, based on the weight of the compound to be hydrogenated, of added ammonia, and in the presence of from 0.001% to 10% by weight, based on the compound to be hydrogenated and calculated as metallic ruthenium, of a ruthenium catalyst supported on an inert carrier selected from the group consisting of calcium carbonate, rare earth oxides, rare earth carbonates, mixed rare earth oxide-carbonates, and mixtures thereof.

3,644,523

## METHOD OF COMBATING WEEDS

Ralph P. Neighbors, Olathe, and Lee V. Phillips, Overland Park, Kans., assignors to Gulf Research & Development Company, Pitsburgh, Pa.

No Drawing. Original application May 29, 1967, Ser. No. 642,174, now Patent No. 3,547,621, dated Dec. 15, 1970. Divided and this application July 31, 1969, Ser. No. 860,462

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 G 6 Claims

Weeds in crops such as oats, corn (maize), wheat and grain sorghum are combated by applying to the locus of of the weeds effective amounts of certain O-substituted amidoximes, particularly O-2,3,6-trichlorobenzoyl and O-3,6-dichloro-2-methoxy-benzoyl esters of cyclopropanecarboxamidoxime and isobutyramidoxime.

3,644,524

## COMBATING WEEDS WITH O-ACYL-3,5-DIALKYL-4-HYDROXYBENZALDOXIMES

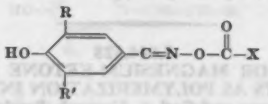
Roger P. Cahoy, Merriam, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Original application Nov. 30, 1967, Ser. No. 686,809, now Patent No. 3,503,732, dated Mar. 31, 1970. Divided and this application Aug. 19, 1969, Ser. No. 870,739

Int. Cl. C07c *131/00*

U.S. Cl. 260—566 AE 2 Claims

In a variety of crops, including broad-leaf species such as tomatoes and soybeans, as well as corn and small grains, particularly rice and wheat, control of noxious grasses, including crabgrass, wild oats, foxtail and shattercane is obtained by preemergent application of compounds having the structural formula



in which R and R' are non-primary alkyl or cycloalkyl substituents having at least 3 carbon atoms and X is an electronegative substituent, for example, dichloromethyl, or an unsaturated hydrocarbon structure such as phenyl or cyclopropyl.

3,644,525

## N-ARALKYL-AND-ARYLHYDROXYALKYL-PROPIOPHENONES AND THE SALTS THEREOF

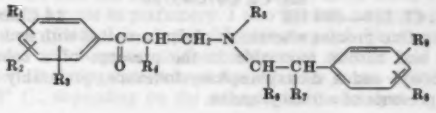
Kurt Thiele, Beethovenstrasse 6, Frankfurt am Main, Germany

No Drawing. Filed Mar. 17, 1969, Ser. No. 807,945

Int. Cl. C07c *91/16, 91/26*

U.S. Cl. 260—570.5 C 17 Claims

Compounds are prepared having the formula



where $R_1$, $R_2$ and $R_3$ are the same or different and are hydrogen, chlorine, hydroxyl, alkoxy or nitro, $R_4$ is hydrogen, methyl or ethyl, $R_5$ is hydrogen or alkyl, $R_6$ is hydrogen or methyl, $R_7$ is hydrogen or hydroxyl, $R_8$ is hydrogen, alkyl, alkoxy, hydroxyl or halogen and $R_9$ is hydroxyl or alkyl with at least two carbon atoms. The compounds can be made in the form of their optically active isomers or diastereoisomers, salts or quaternary ammonium salts.

3,644,526

## OXIDATION OF CYCLOHEXANE

Kazumi Takagi and Takaharu Ishida, Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Feb. 26, 1969, Ser. No. 802,352

Claims priority, application Japan, Mar. 6, 1968, 43/14,829; Oct. 23, 1968, 43/77,604

Int. Cl. C07c *35/08, 45/02*

U.S. Cl. 260—586 B 2 Claims

Cyclohexane is oxidized in a liquid phase in the presence of such a heterogeneous catalyst as a manganese or cobalt borate, particularly a cobalt borate having a $Co/B_2$ molar ratio of 0.5 to 4, whereby the excessive oxidation of cyclohexane and the formation of a borate ester of cyclohexanol can be inhibited and cyclohexanone and cyclohexanol can be produced advantageously.

3,644,527

## 16-METHYL AND 16-METHYLENE-B-NORTESTOSTERONES

Kenneth G. Holden, Haddonfield, N.J., and James F. Kerwin, Broomall, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 373,877, June 9, 1964, now Patent No. 3,488,738. This application Sept. 23, 1969, Ser. No. 860,404

Int. Cl. C07c *35/00, 49/00*

U.S. Cl. 260—586 H 3 Claims

16β-methyl and 16-methylene substituted β-nordehydroepiandrosterones and 17-methyl-B-nortestosterones are prepared by using as a key reaction the degradation of a 16 - dialkylaminomethyl-B-nordehydroepiandrosterone to produce the 16-methylene derivative. This in turn is hydrogenated to the 17β-methyl-B-nor compound. These compounds have prolonged hypotensive activity.

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3,644,528

## CALCIUM OR MAGNESIUM-KETONE REACTION PRODUCTS AS POLYMERIZATION INITIATORS

James D. Brown and Carl A. Uraneck, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,549

Int. Cl. C07c *49/76*

U.S. Cl. 260—591 10 Claims

Polymerization initiators are produced from contacting substantially pure calcium or magnesium metal with diaryl ketones, aryl-substituted cyclopentadienones, or ketones in which the carbonyl group is present in a five-membered carbocyclic ring to which is attached at least two fused aromatic rings.

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3,644,529

## OXO PROCESS

Edmond R. Tucci, Pittsburgh, and Helen I. Thayer and John V. Ward, Oakmont, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Aug. 23, 1966, Ser. No. 574,316

Int. Cl. C07c *45/10*

U.S. Cl. 260—604 HF 14 Claims

An Oxo process wherein an olefin is reacted with hydrogen and carbon monoxide in the presence of a cobalt carbonyl and a dioxaphosphacyclohexane, preferably in the presence of a trialkyl amine.

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3,644,530

## PROCESS FOR PREPARING (2,5-DIHYDROXYPHENYL) DIPHENYL PHOSPHINE

Stanley M. Bloom, Waban, and Ronald F. Lambert, Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,018

Int. Cl. C07f *9/28*

U.S. Cl. 260—606.5 P 4 Claims

Organic phosphines containing a dihydroxyphenyl substituent are prepared by reacting p-benzoquinone and a primary or secondary organic phosphine.

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3,644,531

## 2-PROPYNYLSULFONIUM SALTS

Yukichi Kishida, Atsusuke Terada, Hiromu Takagi, and Toshiharu Kamioka, Tokyo, Japan, assignors to Sankyo Company Limited

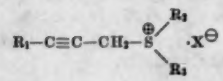
No Drawing. Filed Aug. 8, 1969, Ser. No. 848,713

Claims priority, application Japan, Aug. 13, 1968, 43/57,559

Int. Cl. C07c *149/46*

U.S. Cl. 260—607 B 3 Claims

2-propynylsulfonium salts having the formula



wherein $R_1$ represents hydrogen atom, a straight or branched lower alkyl group, phenyl group or a substituted phenyl group having as a substituent lower alkyl, lower alkoxy, nitro or halogen; $R_2$ and $R_3$ may be the same or different and each represents a straight or branched lower alkyl group; and X represents a halogen atom. The present 2-propynylsulfonium salts exhibit excellent anticoagulant action and thus they can be used in the treatment of thrombophlebitis, phlebothrombosis and other vessel thrombosis and also in the prevention of clotting in surgical procedures. Such 2-propynylsulfonium salts are prepared by reacting a compound having the formula

$$R_1—C\equiv C—CH_2—X$$

wherein $R_1$ and X are as defined above with a thioether compound having the formula

$$R_2—S—R_3$$

wherein $R_2$ and $R_3$ are as defined above.

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3,644,532

## POLYCYCLIC DIMERCAPTANS

Donald R. Arnold, Lincolndale, N.Y., David J. Trecker, South Charleston, W. Va., and Charles E. Stehr, Stamford, Conn., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 365,527, May 6, 1964, now Patent No. 3,483,102. This application Oct. 2, 1968, Ser. No. 764,657

Int. Cl. C07c *149/26*

U.S. Cl. 260—609 D 5 Claims

Dimercaptans of cycloadded dimers of a mercaptonorbornene, mercapto-cyclohexene or mercaptobicyclo [2.2.2] octene are disclosed. They are useful in the production of polymers and as epoxy curing agents.

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3,644,533

## PHENOLS AND PHENOLIC RESINS

Bobby F. Dannels and Alvin F. Shepard, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Application Jan. 30, 1967, Ser. No. 612,334, now Patent No. 3,539,646, dated Nov. 10, 1970, which is a continuation-in-part of application Ser. No. 276,147, Apr. 29, 1963. Divided and this application Dec. 29, 1969, Ser. No. 1,941

Int. Cl. C07c *43/20*

U.S. Cl. 260—612 R 4 Claims

Phenols, phenyl ethers, bisphenols, diethers, mixed phenol ethers and phenolic resins are prepared by reacting a phenol with a non-conjugated open-chain aliphatic or cycloaliphatic polyunsaturated hydrocarbon.

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3,644,534

## METHOD FOR THE PREPARATION OF HYDROXYALKYL ETHERS

Kenneth G. Reabe, Delmont, and Hans Dressler, Monroeville, Pa., assignors to Koppers Company, Inc.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,833

Int. Cl. C07c *43/22*

U.S. Cl. 260—613 D 7 Claims

A process is provided for the production of phenylhydroxalkyl ethers such as phenylhydroxypropyl ether, resorcinol bis(β-hydroxyethyl)ether, catechol bis(β-hydroxyethyl)ether, hydroquinone bis(β - hydroxybutyl)ether, pyrogallol tris(β-hydroxyethyl)ether, and phloroglucinol tris(β-hydroxyethyl)ether by reacting at ambient to 110° C., a monohydric, dihydric, or polyhydric phenol such as phenol, resorcinol, cr pyrogallol and an equivalent of alkylene oxide, such as ethylene oxide, propylene oxide, or butylene oxide per equivalent of phenolic hydroxyl in the presence of an aqueous medium having a pH of 8–13. The product is recovered in high yields by cooling and

separating from the mother liquor. The mother liquor is then recycled to serve as the aqueous medium for a subsequent reaction.

The prepared compounds have aromaticity, an ether linkage, and a reactive hydroxyl group which make them useful as specialized components in polyester and polyurethane resin formulations.

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3,644,535
## ACETYLENIC ETHERS

**John Woolley Batty, Eric Milton Chadwick, and James William Crook, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed July 24, 1969, Ser. No. 844,622**
**Claims priority, application Great Britain, Aug. 8, 1968, 37,954/68**
**Int. Cl. C07c *43/14***
**U.S. Cl. 260—615 B** **1 Claim**

Poly(oxypropylene) and poly(oxyethylene/oxypropylene) derivatives of certain acetylenic alcohols, a process for their manufacture and their use as corrosion-restraining compounds in acid-pickling baths for ferrous metals. The compounds are particularly suitable for use in hydrochloric acid baths and they have little tendency to foam.

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3,644,536
## PROCESS FOR 1,3,5-TRIS(α-HYDROXYISOPROPYL)BENZENE

**Richard A. Bafford, Tonawanda, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.**

**No Drawing. Filed Sept. 18, 1969, Ser. No. 859,193**
**Int. Cl. C07c *29/00***
**U.S. Cl. 260—618 R** **11 Claims**

Preparation of 1,3,5-tris (α-hydoxyisopropyl)benzene by heating a solvent solution of methylbutynol in presence of catalytic amount of nickel tetracarbonyl and a triarylphosphite.

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3,644,537
## PHENOLS AND PHENOLIC RESINS

**Bobby F. Dannels and Alvin F. Shepard, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**No Drawing. Application Jan. 30, 1967, Ser. No. 612,334, now Patent No. 3,539,646, dated Nov. 10, 1970, which is a continuation-in-part of application Ser. No. 276,147, Apr. 29, 1963. Divided and this application Dec. 29, 1969, Ser. No. 1,942**
**Int. Cl. C07c *37/00***
**U.S. Cl. 260—619 B** **4 Claims**

Phenols, phenyl ethers, bisphenols, diethers, mixed phenol ethers and phenolic resins are prepared by reacting a phenol with a non-conjugated open-chain aliphatic or cycloaliphatic polyunsaturated hydrocarbon.

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3,644,538
## HINDERED TRISPHENOLS

**William H. Starnes, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company**

**No Drawing. Original application Nov. 16, 1964, Ser. No. 411,569. Divided and this application Aug. 22, 1967, Ser. No. 662,287**
**Int. Cl. C07c *37/00, 39/00***
**U.S. Cl. 260—619 B** **3 Claims**

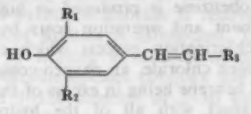
New trisphenols, for example, 1,3,5 - tris(3 - alkyl - 4-hydroxyphenyl)benzene; 1,3,5 - tris(3 - aryl - 4 - hydroxyphenyl)benzene; 1,3,5 - tris(2 - hydroxyphenyl)benzene; and the lower alkyl substituted derivatives thereof, are effective stabilizers for hydrocarbon especially polyolefins due to low volatility and because the oxidation products are not highly colored.

3,644,539
## SYNTHESIS OF HINDERED ALKENYL PHENOLS

**William H. Starnes, Jr., Baytown, Tex., assignor to Esso Research and Engineering Company**

**No Drawing. Filed July 28, 1969, Ser. No. 845,539**
**Int. Cl. C07c *39/18***
**U.S. Cl. 260—619 R** **6 Claims**

The hindered alkenyl phenols having the following structure are useful as antioxidants for hydrocarbons and especially for polyolefins such as polypropylene and are produced by the reaction of a 2,6-dialkylquinone methide with an aldehyde and a phosphorus compound selected from the group consisting of a trialkylphosphine and a trialkylphosphite to produce the hindered alkenyl phenol having the following structure:




where

$R_1$ and $R_2$ are alkyls having 1 to 8 carbon atoms, and
$R_3$ is selected from the group consisting of alkyl and aryl.

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3,644,540
## 5,7 - DIISOPROPYL-1,1-DIMETHYL-6-HYDROXYINDAN AND PROCESS FOR PREPARING SAME

**Thomas F. Wood, Wayne, and George H. Goodwin, Rutherford, N.J., assignors to Givaudan Corporation, Clifton, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 674,103, Oct. 10, 1967. This application July 1, 1968, Ser. No. 741,278**
**Int. Cl. C07c *39/12***
**U.S. Cl. 260—626 R** **1 Claim**

The novel compound, 5,7-diisopropyl-1,1-dimethyl-6-hydroxyindan, (I), and a process for preparing it, are disclosed. I is a colorless crystalline material, M.P. 99°–100° C., and has a strong and pleasant musk odor, I is suitable for use in perfumery. I also exhibits properties as an antioxidant. I is prepared by reacting 2,6-diisopropylphenol and isoprene, in the presence of sulfuric acid or other alkylating catalysts; at temperatures from —20° to 150° C., depending on the strength of the catalyst.

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3,644,541
## ISOPROPYL ALCOHOL PROCESS

**Clarence D. Chang, Princeton, and Albert S. Logiudice, Bridgewater, N.J., assignors to Pullman Incorporated, Chicago, Ill.**

**Continuation-in-part of application Ser. No. 635,586, May 2, 1967. This application Aug. 25, 1969, Ser. No. 857,279**
**Int. Cl. C07c *29/08***
**U.S. Cl. 260—641** **8 Claims**

A method of achieving high conversions of water in a process for the direct hydration of propylene at elevated pressures and temperatures in the presence of an aqueous phosphoric or phosphorous acid catalyst. This is achieved by maintaining the propylene inlet partial pressure above a minimum limit, said partial pressure being a function of reaction temperature and catalyst concentration and simultaneously maintaining the propylene residence time above a minimum level, said residence time being dependent upon the reaction temperature, acid concentration and propylene inlet partial pressure. Preferably the residence time is held below an upper limit to achieve commercially acceptable yields. Preferred operating conditions include propylene inlet partial pressures below 60 atmospheres, temperatures between about 408 and 488° K. and acid concentrations ranging between about 25 and about 65 weight percent.

3,644,542
**BENZENE OXYCHLORINATION**

**Walter H. Prahl, Karlsruhe, Germany, Jay P. Eggert, Bellefonte, Ky., and Sol J. Lederman, Kenmore, Eric H. Scremin, Niagara Falls, and Albert C. Ulrich, Buffalo, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.**

**Continuation-in-part of application Ser. No. 292,460, July 2, 1963, which is a continuation-in-part of applications Ser. No. 133,565, Ser. No. 133,801, and Ser. No. 133,802, all Aug. 25, 1961. This application June 17, 1969, Ser. No. 833,822**

**The portion of the term of the patent subsequent to June 18, 1985, has been disclaimed**

**Int. Cl. C07c** *25/06*

**U.S. Cl. 260—650 R** **6 Claims**

Monochlorobenzene is produced in higher yield with lower investment and operation costs by a continuous benzene oxychlorination process which comprises: (1) passing hydrogen chloride, an oxygen-containing gas and benzene, said benzene being in excess of that theoretically required to react with all of the hydrogen chloride; through at least 2 packed catalytic zones in series, each of said zones being adapted to cause only a partial conversion of the reactants to monochlorobenzene and to cause an increase in temperature of the reaction gas stream, (2) substantially lowering the temperature of the reaction gas stream as it passses from one catalytic zone to the next adjacent catalytic zone by injecting coolant selected from the group consisting of benzene, water, inerts, and mixtures thereof, directly into the reaction gas stream as it passes between each of said zones in an amount sufficient to lower the temperature of the reaction gas to the desired extent, and (3) recovering the monochlorobenzene from the reaction vapors from the final catalytic zone.

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3,644,543
**PROCESS FOR PREPARING HALOGENATED AROMATICS**

**Vincent A. Notaro, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed July 3, 1969, Ser. No. 839,094**

**Int. Cl. C07c** *25/00, 25/04*

**U.S. Cl. 260—650 R** **10 Claims**

A process for preparing a nuclear chloro or nuclear bromo aromatic compound which involves heating an aromatic compound in the presence of a nitrate ion, a nitrite ion, NO or $NO_2$, a chloride or bromide ion, water, oxygen and a fatty carboxylic acid.

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3,644,544
**PROCESS FOR THE PRODUCTION OF IODOPENTAFLUOROETHANE**

**Italo Cammarata, Bollate, Milan, and Martino Vecchio, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**No Drawing. Continuation-in-part of application Ser. No. 675,761, Oct. 17, 1967. This application Nov. 4, 1968, Ser. No. 775,956**

**Claims priority, application Italy, Nov. 16, 1967, 22,759/67**

**The portion of the term of the patent subsequent to Aug. 4, 1987, has been disclaimed**

**Int. Cl. C07c** *17/20, 17/02*

**U.S. Cl. 260—653.7** **10 Claims**

A process for the production of iodopentafluoroethane ($C_2F_5I$) wherein tetrafluoroethylene ($C_2F_4$) is reacted with molecular iodine ($I_2$) to yield di-iodopentafluoroethane ($C_2F_4I_2$). The latter is reacted in an autoclave with lead dioxide ($PbO_2$) and hydrogen fluoride (HF) at a temperature of 25° to 200° C. (preferably 80° C. to 160°) at a pressure of 5 to 50 atmospheres absolute (ata.), preferably 25–36 ata. The molar ratio $HF/C_2F_4I_2$ is 2 to 50 (preferably 10 to 30). The molar ratio $PbO_2/C_2F_4I_2$ is 0.5 to 2 (preferably 0.5 to 1).

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3,644,545
**IMPROVED VAPOR PHASE FLUORINATION PROCEDURE IN THE PRESENCE OF CATALYST AND ALKALI METAL FLUORIDE**

**Walter R. Buckman, Wilmington, Del., assignor to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed June 20, 1968, Ser. No. 738,412**

**Int. Cl. C07c** *19/08, 19/20*

**U.S. Cl. 260—653.7** **8 Claims**

High conversions of fluorinated hydrocarbons are obtained by reacting saturated, aliphatic halocarbon starting materials containing at least one chlorine atom and no atoms other than C, H, F or Cl, with HF, in the presence of a catalyst and also in the presence of an alkali metal fluoride.

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3,644,546
**REACTION OF A DIALKYL ETHER WITH HCl OR HBr IN THE PRESENCE OF AN ORGANIC ACID**

**Russell G. Hay, Gibsonia, and John G. McNulty and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed May 27, 1969, Ser. No. 828,343**

**Int. Cl. C07c** *17/00*

**U.S. Cl. 260—657** **12 Claims**

Increasing the reaction rate of a dialkyl ether with HBr or HCl to produce an alkyl halide which involves carrying out the reaction in the presence of an organic acid having from three to seven carbon atoms.

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3,644,547
**ISOMERIZATION OF ALKYL HALIDES**

**Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Filed Aug. 28, 1968, Ser. No. 755,789**

**Int. Cl. C07c** *17/24*

**U.S. Cl. 260—658 R** **10 Claims**

Alkyl halides are isomerized by treating a particular alkyl halide with an aqueous hydrohalic acid at elevated temperatures above about 200° C. whereby the halogen substituent is transferred to a carbon atom different from that of the original compound.

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3,644,548
**PROCESS FOR PREPARING CYCLODODECATRIENE-1,5,9**

**Hirosi Takahasi, Kadomi-shi, Osaka, Masanori Tanabe, Asaka-shi, Muneaki Yamaguchi, Ikeda-shi, Osaka, and Isao Shiihara, Osaka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**No Drawing. Filed Mar. 17, 1970, Ser. No. 20,417**

**Claims priority, application Japan, Mar. 24, 1969, 44/22,224**

**Int. Cl. C07c** *3/10*

**U.S. Cl. 260—666 B** **2 Claims**

Process for preparing cyclododecatriene-1,5,9 which comprising trimerizing butadiene-1,3 by the use of a ternary catalyst consisting of a titanium compound represented by the general formula

$$TiXn(OCH_2R)_{4-n} \text{ or } TiXn(OAr)_{4-n}$$

wherein X is a member selected from the group consisting of chlorine, bromine and iodine atom, R is a member selected from the group consisting of hydrogen atom and alkyl radical containing from 1 to 5 carbon atoms. Ar is aryl radical and $n$ is 0 or an integer from 1 to 3, an organic aluminum halide and a member selected from the group consisting of acid amides, sulfoxides, aminoxides and nitrons.

3,644,549

## DEHYDROGENATION OF ETHYLBENZENE TO STYRENE USING $SO_2$ AND FERRITE CATALYSTS IN THE FORM OF SPINELS OR PEROVSKITES

Robert A. Innes, Wilkins Township, Allegheny County, and Raymond J. Rennard, Jr., O'Hara Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,904
Int. Cl. C07c *15/10*
U.S. Cl. 260—669 15 Claims

Styrene is produced by the dehydrogenation of ethylbenzene using $SO_2$ and certain ferrite catalysts. The ferrite catalysts in the form of spinels can have the formula: $A_aA'_bFe_cO_4$ where A can be Co, Ni, Zn or Mg (preferably Zn or Mg) and A' can be Cr or La. The sum of $a+b+c$ is 3 and only $b$ can be zero. The ferrite catalysts in the form of perovskites can have the formula: $B_dCr_eFe_fO_3$ where B can be La or Y (preferably La) and $d+e+f=2$ and each individually can be 0.5 to 1.5. These ferrites give very high yields of styrene and are unusually stable to continuous $SO_2$ dehydrogenation-oxidative regeneration cycles.

3,644,550

## SINGLE STAGE CYCLODIMERIZATION OF PARAFFINS TO AROMATIC COMPOUNDS

Harold Beuther, Gibsonia, John A. Ondrey, Springdale, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,067
Int. Cl. C07c *5/26*
U.S. Cl. 260—673 11 Claims

A method for the single stage dimerization of paraffins and mixtures of paraffins with olefins to aromatic compounds using a mixture of chromia-alumina and bismuth oxide. Isobutane and isobutane-isobutene mixtures are converted to p-xylene.

3,644,551

## SINGLE STAGE CYCLODIMERIZATION OF OLEFINS

John A. Ondrey, Springdale, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,068
Int. Cl. C07c *5/26*
U.S. Cl. 260—673 10 Claims

A method for the single stage dimerization of olefins to aromatic compounds using a mixture of chromia-alumina and bismuth oxide. Isobutene is converted to p-xylene.

3,644,552

## PROCESS FOR SEPARATING META XYLENE FROM PARA XYLENE

Vincent A. Notaro, Monroeville, Charles M. Selwitz, Pitcairn, and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,066
Int. Cl. C07c *7/02, 25/02*
U.S. Cl. 260—674 A 15 Claims

A process for separating para xylene from a mixture containing para xylene and meta xylene by selectively halogenating the meta xylene which involves heating the mixture in the presence of copper, manganese, cerium, cobalt, vanadium, chromium, iron, nickel, cadmium, tin, antimony, mercury, bismuth, a noble metal or compounds of these metals; nitrate ions, NO, $NO_2$ or $NO_2Cl$; a chloride ion or a bromide ion; oxygen; and an inert organic solvent containing less than about 28 percent by weight of water.

3,644,553

## PROCESS FOR THE DECOMPOSITION OF A SOLUTION OF HYDROGEN FLUORIDE-BORON TRIFLUORIDE-XYLENES COMPLEX

Susumu Fujiyama and Fumisada Kosuge, Niigata-shi, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

Filed Dec. 8, 1969, Ser. No. 883,132
Claims priority, application Japan, Dec. 17, 1968, 43/92,022
Int. Cl. C07c *7/10*
U.S. Cl. 260—674 A 10 Claims

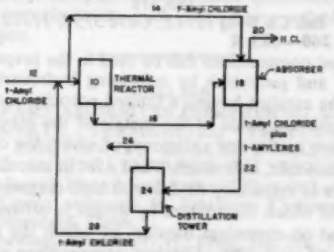
An improved process for decomposing a complex solution at the time of separating xylenes by the formation of a complex of xylenes, hydrogen fluoride and boron trifluoride is disclosed. Inasmuch as only boron trifluoride and a part of hydrogen fluoride is recovered in vapor phase the use of utilities is minimized. The process is characterized by heating a solution of hydrogen fluoride-boron trifluoride-xylenes complex for a liquid residence time of 1–120 minutes at 2–30 kg./cm.² (absolute pressure) with the use of a multistage counter-counter gas-liquid contactor as a decomposer; withdrawing from the top of the decomposer a gas which contains boron trifluoride in higher concentration than in said complex solution; and also withdrawing from the bottom of the decomposer, together with xylenes, liquid hydrogen fluoride which contains substantially no boron trifluoride. A hydrocarbon diluent, when allowed to be co-present in the decomposition reaction, helps obtain still better results. Also, xylenes may be isomerized at the same time with the decomposition of said complex.

3,644,554

## THERMAL RECOVERY OF ISOAMYLENES FROM TERTIARY AMYL CHLORIDE

Earl F. Harper, Oakmont, Clarence R. Murphy, Allison Park, and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 8, 1969, Ser. No. 856,089
Int. Cl. C07c *1/30*
U.S. Cl. 260—677 XA 6 Claims




Isoamylene is recovered from tertiary amyl chloride by thermally decomposing from 50 to 80 weight percent of the tertiary amyl chloride and selectively absorbing the unreacted tertiary amyl chloride and isoamylene in a liquid tertiary amyl chloride solvent.

3,644,555

## PROCESS FOR THE PRODUCTION OF ACETYLENE, OR ACETYLENE AND ETHYLENE BY PYROLYSIS OF HYDROCARBONS

Zoltan Nagy and Laszlo Szepesy, Budapest, and Attila Kovacs and Zsigmond Sebestyen, Veszprem, Hungary, assignors to Magyar Asvanyolaj es Foldgaz Kiserleti Intezet, Veszprem, Hungary

Filed Aug. 26, 1969, Ser. No. 853,107
Claims priority, application Hungary, Aug. 28, 1968, MA-1,884
Int. Cl. C07c *11/24, 3/00*
U.S. Cl. 260—679 10 Claims

This invention relates to a process for producing acetylene or a mixture of acetylene and ethylene from hydro-

carbons, by pyrolysis, carried out by means of the heat quantity produced by a nearly stoichiometric burning of a mixture of combustible gases or vapours and an oxidizing gas, preferably oxygen of technical purity or air enriched in oxygen.

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3,644,556
**PRODUCTION OF HEXADIENES**
**Toshio Hori, Akira Yamamoto, and Masao Shiraishi, Mie-ken, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan**
**No Drawing. Filed Feb. 6, 1969, Ser. No. 797,231**
**Claims priority, application Japan, Feb. 8, 1968, 43/7,872**
**Int. Cl. C07c** *3/10, 11/12*
**U.S. Cl. 260—680 B** **9 Claims**

Ethylene and a 1,3-butadiene equivalent substance are codimerized through the use of a relatively inexpensive catalyst which is a combination of a copper compound (1), a compound (2) of an element of group V–A of the Periodic Table, and a compound (3) which is an alkyl compound or an alkyl halogen compound of an element of Group I, II, or III. Higher activity and higher selectivity for producing 1,4-hexadiene are attainable by the use of a catalyst produced by compounds (1) and (2) are precombined and the resulting combination is purified with an aromatic hydrocarbon or is prepared in the presence of ethylene.

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3,644,557
**CATALYST COMPOSITIONS FOR PREPARING ETHYLENE**
**Michel Senes, Saint Nazaire, Pierre Lhonore, Doual, and Jacques Quibel, Maisons-Laffitte, France, assignors to Société Chimique de la Grande Paroisse, Azote et Produits Chimiques**
**Filed May 26, 1969, Ser. No. 827,756**
**Claims priority, application France, May 30, 1968, 153,371**
**Int. Cl. B01j** *11/42;* **C07c** *3/34, 11/02*
**U.S. Cl. 260—683 R** **19 Claims**

Catalyst compositions can be used in the preparation of ethylene and propylene by reforming hydrocarbons with steam, the catalyst having a limited porosity and containing at least one oxide of the metals of the group formed by the rare earths and antimony, of which the content by weight, as oxide, is between 1 and 4%, in association with a mixture of refractory oxides with high magnesium oxide content of which the content by weight is between 30 and 70%, and of zirconium dioxide, of which the content is between 25 and 40%. Catalyst compositions containing a high content of magnesium from 50 to 70% by weight and a low alumina content which is at most 20% by weight and possibly CuO. Applications of these compositions.

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3,644,558
**PROCESS FOR ISOMERIZING OLEFINS**
**Günther Wilke and Borislav Bogdanović, Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany**
**No Drawing. Filed Oct. 20, 1969, Ser. No. 867,928**
**Claims priority, application Germany, May 14, 1969, P 19 24 628.7**
**Int. Cl. C07c** *5/22, 5/24*
**U.S. Cl. 260—683.2** **10 Claims**

Process for isomerizing olefins by subjecting an isomeric mixture of at least one olefin to contact at low temperatures for an extended period of time with an $\pi$-allyl nickel compound, a Lewis acid and a phosphine.

3,644,559
**DISPROPORTIONATION USING A CATALYST CONTAINING THALLIUM**
**Tadeusz P. Kobylinski, Cheswick, and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**
**No Drawing. Filed Dec. 8, 1969, Ser. No. 883,277**
**Int. Cl. C07c** *3/62, 11/12, 13/00*
**U.S. Cl. 260—683 D** **13 Claims**

A process for converting, by disproportionation, an olefin, particularly an alpha-olefin, to a product containing a mixture of olefins of higher and lower carbon number than at least one of the olefins in the olefin charge, which involves contacting the olefin charge with a novel composition containing molybdenum, tungsten or rhenium and thallium on a support, preferably alumina.

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3,644,560
**OXYDEHYDROGENATION OF ETHANE**
**William Q. Beard, Jr., Wichita, Kans., assignor to Ethyl Corporation, New York, N.Y.**
**No Drawing. Filed July 14, 1969, Ser. No. 841,594**
**Int. Cl. C07c** *11/04, 17/10;* **B01j** *11/40*
**U.S. Cl. 260—683.3** **9 Claims**

Process for the oxydehydrogenation of ethane to ethylene by using catalytic quantities of hydrogen halide. A preferred catalyst includes a low concentration of copper or iron halide with rare earth halide, the ratio of rare earth halide to copper or iron halide being greater than 1:1. Other preferred catalyst components include alkali metal halide and manganese halide.

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3,644,561
**OXYDEHYDROGENATION OF ETHANE**
**William Q. Beard, Jr., Wichita, Kans., assignor to Ethyl Corporation, New York, N.Y.**
**No Drawing. Filed July 14, 1969, Ser. No. 841,623**
**Int. Cl. C07c** *11/04, 17/10;* **B01j** *11/40*
**U.S. Cl. 260—683.3** **9 Claims**

Process for the oxydehydrogenation of ethane to ethylene by using excess quantities of hydrogen halide. A preferred catalyst includes a low concentration of copper or iron halide with rare earth halide, the ratio of rare earth halide to copper or iron halide being greater than 1:1. Other preferred catalyst components include alkali metal halide and manganese halide.

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3,644,562
**NICKEL DIMERISATION CATALYSTS**
**John Robert Jones, Walton-on-Thames, and Thomas J. Symes, Twickenham, England, assignors to The British Petroleum Company Limited, London, England**
**No Drawing. Filed Dec. 5, 1968, Ser. No. 781,632**
**Claims priority, application Great Britain, Dec. 28, 1967, 58,824/67**
**Int. Cl. C07c** *3/10*
**U.S. Cl. 260—683.15 D** **10 Claims**

Linear dimers having an internal double bond are prepared by dimerising an alpha-mono-olefin containing $C_3$–$C_6$ carbon atoms per molecule in the presence of a nickel complex of diisobutyrylmethane or dibenzoylmethane and an aluminium alkyl activating agent.

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3,644,563
**ETHYLENE OLIGOMERIZATION**
**Ronald S. Bauer, Orinda, Harold Chung, Berkeley, Peter W. Glockner, Alameda, and Wilhelm Keim, Berkeley, Calif., and Henry van Zwet, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.**
**No Drawing. Filed Nov. 5, 1969, Ser. No. 874,376**
**Int. Cl. C07c** *3/10*
**U.S. Cl. 260—683.15 D** **10 Claims**

Ethylene is oligomerized to a mixture of olefinic products of high linearity in the presence of a heterogeneous

catalyst comprising (a) a nickel chelate of a bidentate ligand having a tertiary organophosphorus moiety and a carboxymethyl or carboxyethyl group attached directly to the phosphorus atom of the organophosphorus moiety and (b) an inorganic siliceous oxide support.

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3,644,564

## ETHYLENE OLIGOMERIZATION IN THE PRESENCE OF COMPLEX NICKEL-FLUORINE-CONTAINING CATALYSTS

**Henry van Zwet, Amsterdam, Netherlands, and Ronald S. Bauer, Orinda, and Wilhelm Keim, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed Dec. 19, 1969, Ser. No. 886,789**

**Int. Cl. C07c** *3/10*

**U.S. Cl. 260—683.15 D** **15 Claims**

Ethylene is oligomerized to a mixture of linear olefinic products in the presence of an organoaluminum-free catalyst which is the product of the reaction of a nickel compound which is an atom of nickel in complex with an olefinically unsaturated compound with a fluorine-containing ligand. The preferred nickel compound is bicyclooctadiene-1,5-nickel. The fluorine-containing ligands are selected from the group consisting of trifluoroacetic acid, 4,4,4-trifluoro-3-hydroxy-3-trifluoromethylbutyric acid, perfluoro-propene, hexafluoroacetylacetone and trifluoroacetylacetone.

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3,644,565

## ALKYLATION PROCESS

**Giovanni Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.**

**No Drawing. Filed Sept. 18, 1968, Ser. No. 760,724**

**Int. Cl. C07c** *3/52*

**U.S. Cl. 260—683.43** **14 Claims**

Hydrocarbon olefins are converted to higher boiling products comprising polymers and oligomers of the olefin and alkylates of the olefin with paraffinic hydrocarbons in the presence of a Group VIII noble metal distended on a synthetic zeolite, i.e., an aluminosilicate molecular sieve, that has been pretreated with hydrogen at conditions to impart selective polymerization or alkylation activity thereto. In a specific embodiment, ethylene is polymerized to low boiling oligomers comprising dimers, trimers, tetramers, etc. by contacting the ethylene under polymerization conditions with a palladium catalyst deposited on a Y molecular sieve that has been pretreated with hydrogen at a temperature from about 200° to 900° F. or is polymerized to solid polymer when the hydrogen treatment is performed at a temperature from 0° to 100° F. The ethylene is also reacted under alkylation conditions with a paraffin hydrocarbon by contacting the olefin and paraffin under alkylation conditions with a palladium deposited on a Y molecular sieve that has been pretreated by contacting with hydrogen at a temperature of from 100° to about 200° F.

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3,644,566

## SILICON ACRYLIC COPOLYMERS

**Richard D. Kincheloe, Kansas City, Mo., and Joseph H. Scherrer, Shawnee Mission, Kans., assignors to Cook Paint & Varnish Company, Kansas City, Mo.**

**No Drawing. Continuation of application Ser. No. 563,074, July 6, 1966. This application Nov. 17, 1970, Ser. No. 79,850**

**Int. Cl. C08f** *35/02, 29/36;* **C08g** *47/10*

**U.S. Cl. 260—826** **13 Claims**

A silicon-acrylic copolymer of a hydroxy functional acrylic copolymer and an alkoxy functional polyorganosiloxanes. The hydroxy functional acrylic copolymer may consist of a copolymer of hydroxy propyl methacrylate and, for example, a styrene. The silicon-acrylic copolymer may be combined with maleamine-formaldehyde resins or the like to provide coating compositions.

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3,644,567

## PROCESS FOR PREPARING BLOCK COPOLYMERS FROM A TETRAHYDROFURAN POLYMER

**Samuel Smith, Roseville, and Allen J. Hubin, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**No Drawing. Original application Feb. 10, 1966, Ser. No. 527,399. Divided and this application June 23, 1970, Ser. No. 59,768**

**Int. Cl. C08g** *39/00*

**U.S. Cl. 260—829** **6 Claims**

Block copolymers are prepared by polymerizing a cationically polymerizable monomer with polycationically polymer of a tetrahydrofuran. In an example, 10 ml. of tetrahydrofuran and 0.5 ml. of trifluoromethane sulfonic anhydride were reacted at room temperature to produce a dicationically active polytetrahydrofuran. Ethylene oxide was polymerized onto the ends of the tetrahydrofuran polymer at room temperature, and the block copolymer product then was quenched in dilute aqueous sodium hydroxide for 70 hours and was washed with water containing sodium bromide.

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3,644,568

## POLYESTER COMPOSITIONS

**Colin Tilley, Prestbury, David Harris Watson, Faversham, and Michael Campbell, Wellingborough, England, assignors to The Anchor Chemical Company Limited, Clayton, Manchester, England**

**No Drawing. Filed Oct. 31, 1968, Ser. No. 772,411**

**Int. Cl. C08g** *39/10, 45/14*

**U.S. Cl. 260—835** **8 Claims**

An air drying surface coating composition, comprising unsaturated polyesters, a polymer or copolymer formed by polymerising the glycidyl ether of a $\beta$-unsaturated alcohol of at least 3 carbon atoms either alone or with other oxirane compounds, and small quantities of metal salts of organic acids, such salts being soluble in the composition.

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3,644,569

## TWO-PART ADHESIVES COMPRISING AN ISOCYANATE TERMINATED PREPOLYMER, AN ISOCYANATE REACTIVE MONOMER AND AN UNSATURATED POLYESTER

**Gerhard Joseph Pietsch and Armand Francis Lewis, Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Filed Nov. 19, 1968, Ser. No. 777,142**

**Int. Cl. C08f** *29/20;* **C08g** *39/10, 41/04*

**U.S. Cl. 260—835** **10 Claims**

A two-part adhesive comprising (1) a saturated polyether or polyester-based. NCO terminated polyurethane resin and a peroxide catalyst and (2) an unsaturated polyester resin and a cross-linking monomer containing an NCO reactive group, is disclosed.

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3,644,570

## PROCESS FOR THE PREPARATION OF RUBBER MODIFIED NOVOLAK RESINS

**Kerry David Jeffreys, Rhiwbina, Cardiff, Wales, assignor to BP Chemicals (U.K.) Limited, London, England**

**No Drawing. Filed Sept. 24, 1969, Ser. No. 860,808**

**Claims priority, application Great Britain, Oct. 1, 1968, 46,440/68**

**Int. Cl. C08d** *9/10;* **C08g** *37/20, 51/24*

**U.S. Cl. 260—845** **7 Claims**

Rubber modified phenolic resole and novolak resins are prepared by reacting the phenol and aldehyde under the

appropriate reaction conditions in the presence of a latex of a polychloroprene rubber.

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3,644,571

## PROCESS OF HEATING CAPROLACTAM GRAFT COPOLYMERS TO INCREASE MELT STRENGTH

Raymond P. Anderson and Francis R. Galiano, Oakland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 19, 1970, Ser. No. 20,905
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 G 6 Claims

When olefin-maleic anhydride copolymers are employed at low levels in hydrolytic polymerization of caprolactam to yield grafted caprolactam copolymers, the resulting polymers upon heating in the solid state at a temperature of at least 140° C. increase in melt strength to values considerably above the melt strength of conventional polycaprolactam of equivalent melt index. The resulting products having high melt strength may be advantageously used for the manufacture of extruded and blow molded articles.

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3,644,572

## POLYAMIDE-POLYESTER DISPERSIONS CONTAINING SECONDARY AND TERTIARY AMINO TERMINATING MOIETIES ON THE POLYAMIDES

Richard E. Mayer, Richmond, and Lamberto Crescentini, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,253
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 R 12 Claims

A polyamide having a substantial proportion of primary amino end-groups bound to terminating agents containing tertiary or unreactive secondary amino groups can be spun into filaments, when said polymer is melted or melt-blended with polyester, without adverse interaction occurring between the copolymers whereby the resultant product possesses enhanced dyeability characteristics with acid dyes.

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3,644,573

## HEAT STABILIZATION OF POLYESTERS

Kenneth T. Barkey, C Shelburn Hunter, and Walter L. Predmore, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1969, Ser. No. 838,473
Int. Cl. C08g *51/58*
U.S. Cl. 260—860 7 Claims

It has been discovered that polyesters can be stabilized against the spontaneous degradation which the polyesters ordinarily undergo when they are heated to temperatures substantially above their melting points for a period of time by the incorporation thereinto of a small amount of one or more 2(5H) furanones which are compatible with the polyester, are ultraviolet absorbing, and which are, themselves, stable at said temperature.

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3,644,574

## SHAPED ARTICLES OF BLENDS OF POLYESTERS AND POLYVINYLS

Winston J. Jackson, Jr., Herbert F. Kuhfuss, and John R. Caldwell, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 17, 1969, Ser. No. 842,714
Int. Cl. C08f *29/10*; C08g *39/10*
U.S. Cl. 260—873 10 Claims

Blends of 1,4-butanediol polyesters such as derived from 1,4-butanediol and terephthalic or napthalenedicarboxylic acid, with vinyl aromatic polymers such as polystyrene give shaped articles having an excellent balance of physical properties.

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3,644,575

## DYEABLE POLYPROPYLENE FIBERS HAVING IMPROVED PROPERTIES AND DYEING PROCESS FOR PRODUCING ARTICLES WHICH HAVE FASTNESSES

Kazuo Nakatsuka, Fumio Ide, and Kazuo Ito, Ohtakeshi, and Norimasa Yamamoto, Aichi-ken, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1966, Ser. No. 606,090
Claims priority, application Japan, May 23, 1966, 41/32,868
Int. Cl. C08f *29/12*; D06p *3/00, 5/00*
U.S. Cl. 260—876 R 16 Claims

A polypropylene composition comprising polypropylene graft copolymerized with a vinylpyridine and an acrylate or methacrylate ester, the graft copolymer being prepared from a polypropylene which has been previously hydroperoxidized at temperatures of 70–130° C. The mixture is subjected to melt-spinning as such or after incorporation of a monomeric surface active agent and/or an organophosphorus compound to obtain fibers having excellent stability to heat, light and oxidation, dyeability and color fastness.

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3,644,576

## IMPACT-RESISTANT RESINOUS BLENDS CONTAINING VINYL CHLORIDE POLYMER AND METHOD OF MAKING SAME

Eugene J. Sehm, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 5, 1967, Ser. No. 673,055
Int. Cl. C08f *37/18, 29/24*
U.S. Cl. 260—897 C 17 Claims

Resinous blends are disclosed comprising a vinyl chloride base resin and a rubbery, essentially completely gelled and finely particulate polymer of an alkyl acrylate; such blends being more or less rigid and having high impact strength, good resistance to heat distortion and broad processing latitude. A method of making such blends is shown comprising adding such acrylate to the base resin as particles of latex-like proportions preferably imbedded in or dispersed in a hard matrix of a hard vinyl chloride resin, and fusing the resulting mixture under shear at 320° to 440° F. The resultant impact-resistant blends are useful in tubing, pipe, sheets and other structural forms.

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3,644,577

## VINYL HALIDE POLYMERIC BLENDS

Yoon Chai Lee and Quirino A. Trementozzi, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 11, 1968, Ser. No. 783,096
The portion of the term of the patent subsequent to June 24, 1986, has been disclaimed
Int. Cl. C08f *29/22, 29/56, 41/12*
U.S. Cl. 260—876 R 15 Claims

A polymeric blend is prepared from a vinyl halide polymer and an interpolymer formed from a major amount of an ethylenically unsaturated nitrile monomer and a minor amount of copolymerizable monomer from the group of monovinylidene aromatic hydrocarbons, acrylic acids, acrylic esters and vinyl esters. The blends exhibit significantly improved barrier properties in addition to heat resistance and processability, while maintaining or improving other properties including toughness.

3,644,578

## CROSS-LINKABLE COMPOSITIONS BASED ON ELASTOMERS AND ON CROSS-LINKABLE COPOLYMERS OF VINYL CHLORIDE

Alexis Mathieu, Brussels, Belgium, and Claude Barberot, Paris, France, assignors to Solvay & Cie, Rue du Prince Albert, Brussels, Belgium

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,988
Claims priority, application France, Apr. 30, 1968, 150,080
Int. Cl. C08f *29/24, 37/18*
U.S. Cl. 260—876 R 19 Claims

The cross-linkable composition contains from 95 to 20% by weight of one or more elastomers and 5 to 80% by weight of a cross-linkable vinyl polymer based on vinyl chloride. The cross-linkable vinyl polymer is obtained by polymerization of 3 to 50 parts by weight of a mixture of a diolefin and one or more monomers chosen from the nitriles and esters of unsaturated monocarboxylic acid and unsaturated polycarboxylic acid, in the presence of 100 parts of by weight of a copolymer of vinyl chloride and a monomer containing at least 8 carbon atoms and which is a vinyl ester of a monocarboxylic acid, an ester of an unsaturated mono- or polycarboxylic acid or an alkyl vinyl ether. The present cross-linkable compositions possess a highly useful combination of characteristics including excellent mechanical properties which are retained at high temperature, facility of application at low temperatures, resistance to abrasion, chemical agent and low temperature; nonflammability, high thermal stability and good dielectric properties.

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3,644,579

## TRANSPARENT THERMOPLASTIC RESIN HAVING HIGH IMPACT STRENGTH

Masaki Nakajima, Yokohama-shi, Tadayuki Hosogane, Kawasaki-shi, Shoichi Kobayashi, Tokyo, and Shigenobu Ishihara, Fujiwasa-shi, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed May 28, 1969, Ser. No. 828,700
Claims priority, application Japan, Jan. 7, 1969, 44/1,165
Int. Cl. C08f *19/10, 41/12*
U.S. Cl. 260—876 R 6 Claims

A thermoplastic resin having high transparency and impact-strength comprising the components of chlorinated polyethylene, methylmethacrylate and styrene, and a process for producing the same.

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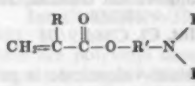
3,644,580

## COPOLYMERS OF PROPYLENE AND AN AMINO-SUBSTITUTED ACRYLIC COMONOMER

William J. Craven, Passaic, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Continuation of application Ser. No. 600,036, Dec. 8, 1966. This application Feb. 16, 1970, Ser. No. 10,098
Int. Cl. C08f *15/04*
U.S. Cl. 260—878 6 Claims

A substantially linear copolymer of propylene and an amino-substituted acrylic comonomer is disclosed which is susceptible to dyeing and printing. The copolymer comprises a first segment which is a crystalline propylene polymer and having attached to an end thereof a second segment which is a polymer of an amino-substituted acrylic monomer having the formula



wherein R is hydrogen or a methyl group, R′ is an alkylene group having 1 to 8 carbon atoms and R″ and R‴ are hydrogen or alkyl groups having 1 to 4 carbon atoms.

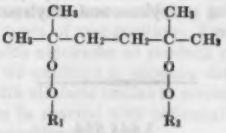
3,644,581

## DIPERESTER FREE RADICAL INITIATOR FOR GRAFT POLYMERIZATION

Donald F. Knaack, Wilmington, Del., assignor to Avisun Corporation, Philadelphia, Pa.

No Drawing. Filed Dec. 5, 1968, Ser. No. 781,595
Int. Cl. C08f *15/04*
U.S. Cl. 260—878 10 Claims

A polyolefin graft copolymer is prepared by the graft polymerization of at least one ethylenically unsaturated monomer onto a polyolefin using a diperester free radical initiator having the formula



wherein $R_1$ and $R_2$ are independently selected from branched alkanoyl radicals having from 4 to 10 carbon atoms.

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3,644,582

## GRAFT POLYMERIZATION WITH A PERESTER INITIATOR AND A PROMOTER

Donald F. Knaack, Talleybrook, Del., assignor to Avisun Corporation, Philadelphia, Pa.

No Drawing. Filed Apr. 14, 1969, Ser. No. 816,016
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 R 10 Claims

A dye-receptive copolymer is prepared by the graft polymerization of at least one ethylenically unsaturated monomer onto a polyolefin in the presence of a perester free radical initiator and a promoter. Suitable promoters are inorganic reducing agents such as a lower valent salt of a multivalent metal, a hydrosulfite, a sulfite, a bisulfite, and a thiosulfate or organic reducing agents such as a formaldehyde sulfoxylate, hydrazine hydrate and hydrazine salts.

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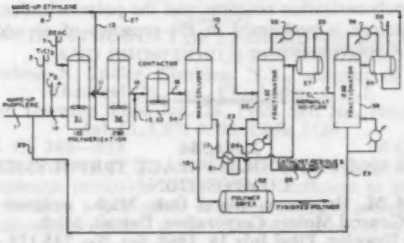
3,644,583

## PRODUCTION AND RECOVERY OF A SOLID MIXED HOMO- AND COPOLYMER

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Apr. 23, 1969, Ser. No. 818,709
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 B 3 Claims



A solid mixed homo- and copolymer product is produced by a combination of a catalyzed mass homo- and a catalyzed mass copolymerization and the solid recovered and washed with an impure fraction of the

monomers so reacted, the fraction being obtained by a fractionation of unreacted excess monomers to produce a stream containing catalyst and any soluble polymer, a stream containing a mixture of the monomers, using a portion of the stream of monomers as said impure fraction, fractionating another portion thereof to obtain one of the monomers for the homopolymerization and a mixture of the monomers for said copolymerization. In an embodiment a mixed polypropylene-propylene-ethylene copolymer is produced and recovered and washed with a stream containing propylene and ethylene, there being recovered also a stream of propylene substantially free from ethylene for use in said homopolymerization and a stream containing propylene and ethylene for use in said copolymerization.

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3,644,584

## GRAFT COPOLYMERS BEARING AT LEAST TWO UNLIKE TYPES OF GRAFT COMPONENTS

Michael Fryd, Broomall, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 640,486, May 23, 1967. This application Aug. 30, 1968, Ser. No. 756,359

Int. Cl. C08f *19/102, 19/16*

U.S. Cl. 260—879 28 Claims

Graft copolymers having polymeric backbone components and multiple unlike types of graft components, and a method for preparing them. The backbone components can be unsaturated polymers or saturated polymers which provide grafting sites; the graft components can be polymers of graft copolymerizable vinyl monomers.

The graft copolymers are useful as can coatings, as film-forming components in coating compositions and as adhesives.

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3,644,585

## PROCESS FOR THE PREPARATION OF POLYBUTADIENE

Motowo Takayanagi, Fukuoka-shi, and Shotaro Sugiura, Tetsuro Matsuura, Haruo Ueno, Keiichi Tsuji, Shinzi Yamamoto, and Fuminori Matumoto, Ube-shi, Japan, assignors to Ube Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,706

Claims priority, application Japan, Dec. 19, 1967, 42/80,934

Int. Cl. C08f *15/04*

U.S. Cl. 260—879 12 Claims

Process for the preparation of polybutadiene by polymerizing 1,3-butadiene in the presence of a cis-1,4-polymerization catalyst, characterized in that trans-1,4-polybutadiene is added to the polymerization system in advance of the polymerization reaction, and the polymerization of 1,3-butadiene is performed in the presence of so added trans-1,4-polybutadiene.

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3,644,586

## HIGH MODULUS, HIGH IMPACT TERPOLYMER COMPOSITION

Edward M. Hagerman, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Filed July 16, 1968, Ser. No. 745,128

Int. Cl. C08f *15/04*

U.S. Cl. 260—880 R 2 Claims

A styrene-acrylonitrile grafted polyisoprene composition wherein the polyisoprene is polymerized to a high molecular weight, characterized by a limiting viscosity number of at least 1.6 in benzene at 30° C., has a tensile modulus of elasticity of at least about 500,000 p.s.i. and an Izod impact strength at about room temperature of greater than 4.0 foot pounds per inch of notch.

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3,644,587

## CHEMICALLY CONTROLLING GRATING AND RUBBER PARTICLE SIZE IN MANUFACTURE OF HIGH IMPACT POLYSTYRENE USING A 2-STEP PROCESS

Arne Finberg, Edison, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Apr. 3, 1969, Ser. No. 813,269

Int. Cl. C08f *15/04*

U.S. Cl. 260—880 4 Claims

High impact polystyrene is produced by free radical catalytic bulk prepolymerization of a solution of a rubber and styrene followed by suspension polymerization. Polymers having improved mechanical and rheological properties are produced by using in the bulk stage, an azo initiator during the phase inversion stage and adding a peroxide initiator just before the inversion is completed or thereafter.

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3,644,588

## BLOCK POLYMER HYDROGENATION PROCESS

Howard L. Hassell, San Leandro, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 17, 1969, Ser. No. 858,894

Int. Cl. C08f *15/04, 27/24*

U.S. Cl. 260—879 6 Claims

Block copolymers of conjugated dienes and monovinyl arenes may be substantially completely hydrogenated by a two-stage process, the first stage under mild conditions to hydrogenate the diene blocks, the second stage at more strigent conditions to hydrogenate the monovinyl arene blocks, the latter stage being conducted in the presence of certain catalyst modifiers such as alcohols.

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3,644,589

## METHOD OF IMPARTING SELF-EXTINGUISHING FLAME PROPERTIES TO IMPACT-MODIFIED POLYVINYL CHLORIDE

Earnest Moore, Akron, and George H. Wear, Mogadore, Ohio, assignors to The General Tire & Rubber Company

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,091

Int. Cl. C08f *45/62*

U.S. Cl. 260—890 1 Claim

This invention concerns a method of imparting self-extinguishing flame properties to impact-modified polyvinyl chloride based resins by the step of adding to the resin a compound selected from the group consisting of organotin maleates, organotin mercaptides, stannous oxide, and mixtures thereof.

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3,644,590

## DIENE/NITRILE ELASTOMERIC BLENDS

Douglas Coulthard, Sarnia, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,961

Claims priority, application Canada, Jan. 16, 1969, 40,288

Int. Cl. C08d *9/08*

U.S. Cl. 260—894 9 Claims

Improved oil-resistant vulcanizate is prepared by vulcanizing a blend of (1) a rubbery copolymer of a 2-alkyl butadiene-1,3 and an acrylic nitrile with (2) a rubbery copolymer of butadiene-1,3 and acrylonitrile. The preferred copolymer (1) is isoprene/acrylonitrile copol-

ymer. The vulcanizate is characterized by improved tear strength, compression set and oil-aging properties and is suitable for the production of thin-walled moulded articles.

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3,644,591

## SIZING FORMULATIONS FOR POLYMERIC MATERIALS

**Harold W. Wolf and Stanley E. Ross, Clifton, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.**

**No Drawing. Original application Aug. 28, 1967, Ser. No. 663,490, now Patent No. 3,502,743. Divided and this application Oct. 20, 1969, Ser. No. 871,329**

**Int. Cl. C08f** *33/08*

**U.S. Cl. 260—895** **6 Claims**

This invention relates to heat and humidity resistant sizing formulations for polyolefin yarns, including polypropylene, comprising:

(a) a major amount of a resin component selected from
  (1) hydantoin formaldehyde resin,
  (2) a copolymer of vinyl pyrrolidone and water insoluble comonomer,
  (3) a copolymer of vinyl acetate and water insoluble comonomer, admixed with:
(b) a minor amount of a polyvinyl, containing moiety, e.g. polyvinyl alkyl ether.

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3,644,592

## PROPYLENE POLYMER COMPOSITION CONTAINING SMALL AMOUNTS OF UREA, PHTHALIC ANHYDRIDE, AND PVC

**Dixie E. Gilbert, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**No Drawing. Filed Dec. 29, 1969, Ser. No. 888,869**

**Int. Cl. C08f** *29/24*

**U.S. Cl. 260—897** **12 Claims**

Polypropylene and block copolymers of propylene and ethylene are improved in optical properties, gas permeability properties, and other properties by adding thereto phthalic anhydride, urea, and polyvinyl chloride.

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3,644,593

## COMPOSITIONS OF MATTER COMPRISING OXYBENZOYL POLYESTERS AND POLYFLUORINATED ADDITION POLYMERS

**Bernard E. Nowak, Lancaster, Steve G. Cottis and James Economy, Buffalo, and Paul J. Steiner, Snyder, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.**

**Filed May 28, 1969, Ser. No. 828,691**

**Int. Cl. C08f** *29/22*

**U.S. Cl. 260—900** **20 Claims**

A composition of matter comprising:

(A) an oxybenzoyl polyester and
(B) a polyfluorinated addition polymer which is thermally stable at at least 400° F.

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3,644,594

## POLYVINYL ACETAL INTERLAYERS CONTAINING COPOLYMERIC ADDITIVES

**George E. Mont and Saul M. Cohen, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Apr. 22, 1969, Ser. No. 818,403**

**Int. Cl. C08f** *29/50*

**U.S. Cl. 260—901** **8 Claims**

Disclosed herein are polyvinyl acetal interlayers having improved impact strength which contain from 0.5 to 5.0 parts per hundred parts of polyvinyl acetal resin (phr.) of an additive which is the copolymerization product of at least one vinyl ester and at least one ester of acrylic methacrylic acid.

3,644,595

## REACTIONS OF ELEMENTAL PHOSPHORUS AND PHOSPHORUS ESTER REACTION PRODUCTS THEREOF

**Chisung Wu, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 527,492, Feb. 15, 1966. This application Dec. 17, 1969, Ser. No. 886,037**

**Int. Cl. C07f** *9/02, 9/32, 9/40*

**U.S. Cl. 260—920** **13 Claims**

Organophosphorus compositions are prepared by reacting elemental phosphorus with an alcohol or mercaptan and an epoxide or episulfide in the presence of a basic catalyst. The compositions are useful as intermediates for preparing many types of compositions. For instance, they can be reacted with aldehydes to produce polyols of wide utility, they can be oxidized to produce derivatives which can be reacted with alkylene oxides to produce useful polyols, and they can be reacted with activated olefins to produce useful compositions.

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3,644,596

## PROCESS FOR THE MANUFACTURE OF NEUTRAL POLYPHOSPHORIC ACID ESTERS BY REACTING PHOSPHORUS PENTOXIDE AND BORIC ACID ESTERS

**Klaus-Dieter Kampe and Edgar Fischer, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany**

**No Drawing. Original application Oct. 23, 1965, Ser. No. 504,187. Divided and this application Apr. 14, 1969, Ser. No. 841,645**

**Int. Cl. C07f** *9/06, 5/04*

**U.S. Cl. 260—922** **2 Claims**

A process has been provided for producing neutral polyphosphoric acid ester derivatives which comprises reacting an acid ester with phosphorus pentoxide at a temperature within the range of −78° C. to +140° C., in the absence of moisture and in a mole ratio of ester to phosphorus pentoxide from 0.05 to 9 moles ester to 1 mole phosphorus pentoxide, said acid ester being defined by the general formula

$$(R')_mB-(OR)_n$$
$$\downarrow$$
$$(R'')_l$$

wherein $1+m+n=3$ in which formula R represents a saturated, unsaturated, oxalkylated, or halogenated aliphatic radical of 1 to 12 carbon atoms, or an aromatic radical of 1 to 12 carbon atoms, R′ and R″ each represents a hydrogen, a saturated, unsaturated, oxalkylated, or halogenated aliphatic or cycloaliphatic radical of 1 to 12 carbon atoms or an aromatic radical of 1 to 12 carbon atoms. These compounds are useful as catalysts for production of polyacetals.

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3,644,597

## REACTION PRODUCT OF 2,3-DIBROMOPROPANOL AND PHOSPHORUS PENTOXIDE

**Abraham S. Endler, Flushing, N.Y., assignor to Apex Chemical Co., Inc., Elizabethport, N.J.**

**No Drawing. Filed Jan. 28, 1969, Ser. No. 794,805**

**Int. Cl. C07f** *9/08;* **C09k** *3/28*

**U.S. Cl. 260—933** **9 Claims**

The product of the reaction of 2,3-dibromopropanol, phosphorus pentoxide in an amount sufficient to provide therein from 1 to 2 atoms of phosphorus per molecule of 2,3-dibromopropanol, either additional phosphorus pentoxide, phosphoric acid or polyphosphoric acid in an amount to provide, with the first mentioned phosphorus pentoxide, a total of 3 to 25 atoms of phosphorus per molecule of 2,3-dibromopropanol and sufficient free water, if necessary, to provide, with any combined water that may be present, a water content of 0.8 molecule thereof for each phosphorus atom in the additional phosphorus

pentoxide, the phosphoric acid or the polyphosphoric acid, is dissolved in water with sufficient ammonia to adjust the pH of the resulting solution to within the range from 5 to 8, whereby to provide a water-soluble flame retardant for textile fibers or fabrics. The reaction mixture may further include a maximum of 1 molecule of urea for each 2 atoms of phosphorus in the total number of the latter. The solution for imparting flame retarding properties to textile materials may include a fire retardant salt, such as ammonium phosphate, along with the stated reaction product provided that the latter constitutes at least 10 wt. percent of the total solids content of the solution.

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**3,644,598**

**1 - ALKOXY(-ALKENYLOXY, -PHENOXY) - 1-THIONO-3-CHLORO(3-ALKYL)PHOSPHOLINES**

**Reinhard Schliebs, Cologne-Flittard, Hanshelmut Schlor, Wuppertal-Elberfeld, and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed June 3, 1969, Ser. No. 830,122**
**Claims priority, application Germany, June 14, 1968, P 17 68 662.3**
**Int. Cl. A01n** *9/36;* **C07d** *105/04*
**U.S. Cl. 260—936** **10 Claims**

1-alkoxy(-alkenyloxy, -phenoxy)-1-thiono-3-chloro(3-alkyl)phospholines, i.e. 1-(alkoxy, alkenyloxy, chloroalkoxy, alkylphenoxy, alkylmercaptophenoxy and chlorosubstituted phenoxy)-3-(chloro and alkyl)-$\Delta^3$ and $\Delta^2$-phospholines, which possess nematocidal, arthropodicidal, especially acaricidal and insecticidal, and fungicidal properties.

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**3,644,599**

**PHOSPHONATE ESTERS OF POLYPHENYL ETHERS OF PROPANOLS**

**Erich Kuehn, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.**

**No Drawing. Filed May 14, 1968, Ser. No. 728,913**
**Int. Cl. C07f** *9/40;* **C08** *22/44*
**U.S. Cl. 260—951** **7 Claims**

Polyol adjuvants are provided which have the property of imparting flame-retardant characteristics to polyurethane foams. The adjuvants are prepared by condensing at least one mole of 3-halo-1,2-propanediol and at least one mole of 1,3-dihalo-2-propanol with a tetrahalo bisphenol A or, alternatively, with the reaction product of at least one mole of a phenol, a chlorophenol and at least one mole of the same or another phenol with at least one mole of formaldehyde. The condensation products are subsequently reacted with the salt of a saturated or unsaturated partial ester of phosphoric acid and optionally brominated in the latter case. Flame-retardant polyurethane foams are disclosed containing the novel polyol adjuvants.

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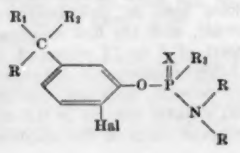
**3,644,600**

**2-HALO-4-ALKYL-PHENYL-PHOSPHORAMIDATES**

**Ernst Beriger, Neuallschwil, Switzerland, assignor to Ciba Limited, Basel, Switzerland**

**No Drawing. Filed Feb. 26, 1969, Ser. No. 802,627**
**Claims priority, application Switzerland, Mar. 1, 1968, 3,083/68**
**Int. Cl. A01n** *9/36;* **C07f** *9/12, 9/22*
**U.S. Cl. 260—959** **10 Claims**

Compounds of the formula



in which R, $R_1$ and $R_2$ represent aliphatic residues, $R_3$ represents an alkyl group which may be linked with the phosphorus atom through oxygen or sulfur, X is O or S and Hal represents a halogen atom. The phosphoric acid ester amides are effective as selective herbicides as well as plant-growth regulators in useful plant crops.

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**3,644,601**

**CONTROL OF ISOMER RATIO IN REACTION PRODUCTS PREPARED BY PHOSPHORYLATION OF ENOLATE IONS**

**Bernard Miller, Amherst, Mass., and Howard Margulies, Princeton Junction, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Continuation-in-part of application Ser. No. 659,014, Aug. 8, 1967. This application May 7, 1969, Ser. No. 822,619**
**Int. Cl. C07f** *9/08, 9/12;* **A01n** *9/36*
**U.S. Cl. 260—972** **6 Claims**

Enolate ions are phosphorylated in the presence of a solvent and a strong base to yield a product mixture containing trans and cis isomers. Certain unique combinations of solvents and bases provide reaction products in which the trans isomer predominates while other combinations provide reaction products in which the cis isomer predominates. Since one isomer often exhibits superior pesticidal activity when compared to the other isomer, the processes of this invention provide a convenient route for obtaining the desired isomer.

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**3,644,602**

**PROCESS FOR PRODUCING TRIALKYL PHOSPHATES**

**Edward F. Orwoll, Baltimore, Md., assignor to FMC Corporation, New York, N.Y.**

**No Drawing. Filed Aug. 5, 1968, Ser. No. 749,971**
**Int. Cl. C07f** *9/08;* **C07c** *31/30*
**U.S. Cl. 260—974** **10 Claims**

Process for the preparation of tris($C_6$ to $C_{12}$ alkyl) phosphates from phosphoryl chloride and a corresponding alkali metal ($C_6$ to $C_{12}$) alkoxide. The alkali metal ($C_6$ to $C_{12}$) alkoxide is prepared in high yield and high purity by an alkoxide exchange reaction between an alkali metal alkoxide of a $C_4$ or $C_5$ saturated primary alcohol and a $C_6$ to $C_{12}$ alcohol.

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**3,644,603**

**METHOD OF MAKING 2-AMINOETHYL PHOSPHATE**

**Perttu V. Laakso, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.**

**No Drawing. Filed Dec. 30, 1968, Ser. No. 788,031**
**Int. Cl. C07f** *9/08*
**U.S. Cl. 260—978** **4 Claims**

Method of making 2-aminoethyl phosphate in high yield by evaporating the water of solution from an aqueous mixture of 2-aminoethanol and orthophosphoric acid in equimolar proportions at a temperature not over 110° C., then heating gradually to a temperature of 150–210° C. at reduced pressure to remove an equimolar proportion of water of reaction.

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**3,644,604**

**NUCLEAR FUEL BODY AND PROCESS FOR MAKING SAME**

**James Ray Hooker, San Diego, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission**

**No Drawing. Filed Nov. 14, 1969, Ser. No. 877,030**
**Int. Cl. G21c** *21/02*
**U.S. Cl. 264—.5** **8 Claims**

Porous nuclear fuel bodies are made from a mixture of a thermosetting resin, such as a phenol-aldehyde resol

resin or a furfural alcohol resin, a curing agent and fuel particles having fission product-retentive coatings. The curing agent is included in an amount at least about three times the amount normally employed to completely polymerize the resin. This substantial excess of curing agent causes curing to proceed rapidly and entraps gas bubbles in the hardening polymer matrix. After curing, carbonization is carried out which leaves the coated particles dispersed in a porous carbon matrix. Fuel particle coatings, particularly pyrocarbon coatings, can form strong bonds with such thermosetting resins. The excess of curing agent avoids the establishment of stresses in the coatings that might result ultimately in cracking.

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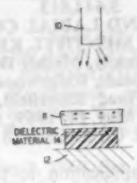
3,644,605

## METHOD FOR PRODUCING PERMANENT ELECTRET CHARGES IN DIELECTRIC MATERIALS

**Gerhard M. Sessler, Summit, and James E. West, Plainfield, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Feb. 11, 1969, Ser. No. 798,411**
**Int. Cl. H04r** *7/00, 19/00*
**U.S. Cl. 264—22** **1 Claim**




Stable thin film electrets are produced by directing an electron beam on a dielectric material in a controlled fashion. Electron absorption in the film and induced secondary emission, both from the film and from an adjacent dielectric surface, aid in producing stable electrets with superior charge characteristics and very long lifetimes.

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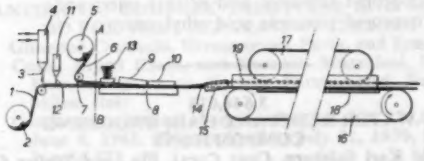
3,644,606

## PROCESS FOR THE MANUFACTURE OF FOAM SLABS

**Jacques Augé, André Guillaume, and Claude Tourniaire, Lyon, France, assignors to Rhone-Poulence S.A., Paris, France**

**Continuation of application Ser. No. 675,169, Oct. 13, 1967. This application Aug. 20, 1970, Ser. No. 65,690**
**Claims priority, application France, Oct. 18, 1966, 80,424**
**Int. Cl. B29d** *27/04*
**U.S. Cl. 264—47** **5 Claims**



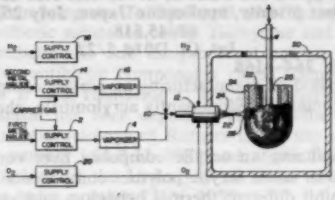

Foam slabs are made by feeding a foamable liquid polyurethane mixture between two sheets which are brought together at an angle of less than 10°, sealing the edges of the sheets together, allowing the mixture to foam, and shaping the slab so obtained.

3,644,607

## USE OF VAPOR PHASE DEPOSITION TO MAKE FUSED SILICA ARTICLES HAVING TITANIUM DIOXIDE IN THE SURFACE LAYER

**Rodney A. Raques and Foster L. Gray, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 18, 1969, Ser. No. 886,252**
**Int. Cl. C04b** *41/32, 35/14;* **C23c** *11/08;* **B28b** *11/04*
**U.S. Cl. 264—60** **4 Claims**




An article composed of a metal oxide having a composition of two or more metal oxides the concentration of which can preferentially or selectively be varied throughout its thickness. The method for making the article includes vapor phase hydrolysis of a metal halide deposition of the resultant metal oxide onto a deposition surface. In an exemplary mode silicon dioxide is deposited on a deposition mandrel until a predetermined thickness is laid down. Thereafter a mixture of silicon dioxide and titanium dioxide are deposited on the previously built-up silicon dioxide layer. The metal oxide article thus formed is a porous, amorphous structure. For most uses this structure is then sintered to form a fused metal oxide structure. This method of forming an article allows preferential variance of the thermal expansion of a fused silica crucible or tube throughout its wall thickness.

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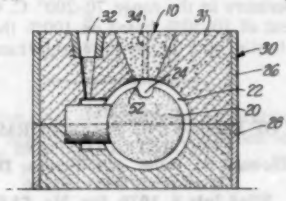
3,644,608

## METHOD OF MAKING A NON-METALLIC CAST CHILL

**John J. Valentine, 1518 McWood St., West Covina, Calif. 91790**

**Continuation-in-part of abandoned application Ser. No. 582,832, Sept. 29, 1966. This application Nov. 26, 1969, Ser. No. 880,074**
**Int. Cl. B28b** *1/08;* **B29c** *1/02*
**U.S. Cl. 264—71** **8 Claims**




A method of and means for producing the various elements of a metal forming mold, such as a cope, drag, core, and/or chill, by casting each element from an improved high temperature resistant casting composition and thereafter treating the metal forming surfaces of each cast element with a mixture of phosphoric acid and furfuryl alcohol resin to harden the surfaces and impregnate the latter with carbon. A method of and means for producing a cast foundry chill involving sealing the open end of a chill form to a selected surface region of a pattern, filling the form with a chill casting composition, and curing the composition to provide a finished chill for use in subsequent molding of a part in a mold cavity conforming to the pattern.

3,644,609
**METHOD OF MANUFACTURING ACRYLIC COMPOSITE YARN**
**Kazumi Nakagawa and Keitaro Shimoda, Saidaiji, Japan, assignors to Japan Exlan Company Limited, Oska, Japan**
**No Drawing. Continuation of abandoned application Ser. No. 817,249, Mar. 7, 1969, which is a continuation of abandoned application Ser. No. 566,238, July 19, 1966. This application Mar. 5, 1971, Ser. No. 121,526**
**Claims priority, application Japan, July 25, 1965, 40/45,518**
**Int. Cl. D01d** *5/22*
**U.S. Cl. 264—168** **1 Claim**

A method of manufacturing an acrylic composite fiber which contains predominantly acrylonitrile, characterized by

(a) spinning an acrylic composite fiber composed of two or more acrylic polymer components tending to exhibit different thermal behaviors and arranged eccentrically along the entire length of said fiber,
(b) stretching said fiber,
(c) crimping said fiber mechanically, and
(d) finally heat-treating said fiber in a relaxed state with its moisture content adjusted to be from 50 to 120% relative to the dry weight of said fiber.

The present invention also provides for fibers produced by the aforementioned method, having coil crimps of from 12.4 to 17.3 crimps per 25 mm. of fiber length, and having a degree of crimping of between 13.4 to 20.9%.

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3,644,610
**BIAXIALLY ORIENTING CRYSTALLIZED POLYETHYLENE - 1:2 - DIPHENOXYETHANE-4:4'-DICARBOXYLATE**
**Richard Harold Barclay Buteux, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England**
**No Drawing. Continuation-in-part of application Ser. No. 717,960, Apr. 1, 1968. This application Mar. 24, 1970, Ser. No. 22,383**
**Claims priority, application Great Britain, Apr. 20, 1967, 18,285/67**
**Int. Cl. B29d** *7/24*
**U.S. Cl. 264—289** **2 Claims**

Balanced biaxially oriented sheets of polyethylene-1:2-diphenoxyethane-4:4'-dicarboxylate are made by stretching crystallized sheets 1.2 to 4× equally in each direction at a temperature in the range 70–200° C. Crystallization to an extent of 10–30% based on 100% theoretical is induced by heating at a temperature in the range 80–245° C.

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3,644,611
**ART OF REMOVING FIBER FORMS FROM CONCRETE COLUMNS**
**Howard M. Wiles, 420 Windsor Drive, Waukesha, Wis. 53186**
**Filed July 8, 1970, Ser. No. 53,069**
**Int. Cl. B28b** *13/06*
**U.S. Cl. 264—334** **8 Claims**

A fiber cylindrical form has a length of wire extending longitudinally along its inner surface, with one end of the wire anchored to one end of the form and with the other end of the wire accessible from the exterior at the opposite end of the form where it may be wound on an arbor to split the form longitudinally.

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3,644,612
**METHOD FOR HARDENING UNSATURATED POLYESTER RESINS**
**Heinz Meyer and Dieter Schmid, Munich, Hans Schwarzer, Krailling, and Hansjoachim Twittenhoff, Strassblach, Germany, assignors to Eleitrochemische Werke Munchen AG, Hollriegelskreuth, near Munich, Germany**
**No Drawing. Filed July 22, 1969, Ser. No. 843,798**
**Claims priority, application Germany, Aug. 2, 1968, P 17 69 898.5**
**Int. Cl. C08g** *17/16;* **C09d** *3/64*
**U.S. Cl. 260—22 CA** **19 Claims**

Method for hardening unsaturated polyester resins comprising utilizing for the hardening a mixture of metal accelerator, peroxide and an aliphatic polyamine.

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3,644,613
**ORAL, NASAL AND LABIAL COMPOSITIONS CONTAINING MENTHYL KETO ESTERS**
**Alfred H. Moeller, Tenafly, Michel Demont, River Vale, and Albert G. Nickstadt, Ridgewood, N.J., assignors to Nickstadt-Moeller, Inc., Ridgefield, N.J.**
**No Drawing. Filed May 14, 1969, Ser. No. 824,664**
**Int. Cl. A61k** *7/16*
**U.S. Cl. 424—49** **6 Claims**

Compositions for application to the oral and nasal areas of the body are disclosed which contain alpha, beta, gamma, delta, epsilon, zeta and eta keto esters of menthol. These compositions impart a long-lasting cooling sensation to tissues of the lips and the mucous membranes of the oral cavity and nasal passages.

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3,644,614
**ULTRAVIOLET RADIATION PROTECTION COMPOSITION, CONTAINING A MIXTURE OF CINNAMIC ACID ESTERS**
**Benno Streschnak, Krefeld, and Willy Doll, Quelle, Germany, assignors to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Germany**
**No Drawing. Filed Dec. 8, 1969, Ser. No. 833,360**
**Claims priority, application Germany, Sept. 5, 1969, P 19 45 054.5**
**Int. Cl. A61l** *23/00;* **A61k** *7/00*
**U.S. Cl. 424—60** **2 Claims**

A composition highly useful for the protection human skin against absorption of ultraviolet radiation; the composition being a mixture of 4-methoxy cinnamic acid isopropyl ester and at least one ester from the group consisting of

4-isopropyl cinnamic acid ethyl ester;
4-isopropyl cinnamic acid methyl ester; and
2,4-diisopropyl cinnamic acid methyl ester; and
2,4-diisopropyl cinnamic acid ethyl ester.

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3,644,615
**WATER RESISTANT HAIR GROOMING COMPOSITIONS**
**Harold Karl Salzberg, Cape Coral, Fla., and Walter G. Sten, Valhalla, Westchester, N.Y., assignors to Borden Inc., New York, N.Y.**
**No Drawing. Filed July 1, 1968, Ser. No. 741,302**
**Int. Cl. A61k** *7/10*
**U.S. Cl. 424—70** **6 Claims**

This invention relates to novel hair grooming compositions capable of forming water resistant and alkali soluble films on hair comprising a proteinaceous substance and

selective insolubilizing agent selected from the group consisting of formaldehyde and formaldehyde-evolving compounds, and heavy metal compounds and to a method of setting hair comprising applying said composition to hair and drying it on the hair to a water-resistant film, whereby the hair resists deformation on contact with rain or water but may be easily washed free of the applied film by simple shampooing with soaps and detergents.

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3,644,616

## SYNERGISTIC COMPOSITION OF RIFAMPICIN AND STREPTOMYCIN

**Edward Alexander Konopka, Murray Hill, and Justus Melchior Gelzer, Summit, N.J., assignors to Ciba Corporation, Summit, N.J.**

**No Drawing. Filed Mar. 24, 1969, Ser. No. 809,967**

**Int. Cl. A61k *21/00***

**U.S. Cl. 424—114** **4 Claims**

Rifamycines or their semisynthetic derivatives, in combination with other antibiotics, exhibit synergistic effects against Gram-negative bacteria.

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3,644,617

## MITOMALCIN AND METHOD FOR ITS PRODUCTION

**Michael Axelrod, Hackensack, and William S. Marsh, Wanaque, N.J., Koppaka V. Rao, Cambridge, Mass., and Charles S. Sodano, Maywood, N.J., assignors to Pfizer Inc.**

**Filed May 9, 1968, Ser. No. 727,932**

**Int. Cl. A61k *21/00***

**U.S. Cl. 424—115** **2 Claims**

Mitomalcin, an antibiotic and complexing agent, and its production by *Streptomyces malayensis*, a new species of *Streptomyces*, and variants thereof are described.

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3,644,618

## STABLE COMPOSITION OF SYNTHETIC SODIUM ESTRONE SULFATE

**George W. Holden, Preville, Quebec, Canada, assignor to Charles E. Frosst & Co., Montreal, Quebec, Canada**

**No Drawing. Continuation-in-part of application Ser. No. 523,252, Jan. 27, 1966, which is a continuation-in-part of application Ser. No. 241,135, Nov. 30, 1962. This application Oct. 29, 1968, Ser. No. 771,668**

**Int. Cl. A61k *17/06***

**U.S. Cl. 424—100** **6 Claims**

The invention disclosed herein relates to a synthetic sodium estrone sulfate preparation comprising synthetic sodium estrone sulfate in admixture with a water and alcohol soluble extract of pregnant mares' urine.

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3,644,619

## ANTIBIOTIC COMPLEX TAIMYCINE AND METHOD FOR THE PREPARATION THEREOF

**Giuseppe Cassinelli, Rivanazzano, Pavia, and Ernesto Cotta, Arpad Grein, and Rosanna Mazzoleni, Milan, Italy, assignors to Società Farmaceutici Italia, Milan, Italy**

**Continuation-in-part of application Ser. No. 734,875, June 6, 1968. This application July 21, 1970, Ser. No. 56,773**

**Claims priority, application Italy, June 6, 1967, 16,923/67**

**Int. Cl. A61k *21/00***

**U.S. Cl. 424—121** **11 Claims**

A microbiological process for the preparation of the new antibiotic substance Taimycine and its salts consisting of Taimycine A, Taimycine B, Taimycine C. The process is characterized in that the new microorganism *Streptomyces michiganensis* var. *amylolyticus* is cultivated in aerobic conditions in a liquid cultural medium containing a carbon source, nitrogen source and mineral salts at a temperature of from 24° to 37° C. over a period of time of from 72 to 160 hours at a pH of from 6 to 8 and that the antibiotic complex thus obtained is isolated from the fermentation broth by extraction with suitable solvents and successive precipitation and the antibiotic complex may be separated into the three components Taimycine A, Taimycine B and Taimycine C. A new antibotic substance called Taimycine and its salts having antihelmintic and antiprotozoal activity and its three active antibiotic components called Taimycine A, Taimycine B and Taimycine C are also described. The microorganism has been deposited among others at the Institute of Microbiology of Rutgers University receiving the index number I.M.R.U. 3932 and at the Institute of Plant Pathology at the University of Milan (Italy), receiving the index number I.P.V. 1953.

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3,644,620

## ANTIPHLOGISTIC

**William J. Vittone, Rte. 1, Box 7, Hurley, Wis. 54534**

**No Drawing. Filed May 22, 1970, Ser. No. 39,884**

**Int. Cl. A61k *27/00***

**U.S. Cl. 424—195** **2 Claims**

An antiphlogistic remedy for external use in the treatment of inflammation of joints as in arthritis, treatment of degeneration of the bone, bursitis and treatment of the sinuses, and the method of preparing the particular antiphlogistic.

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3,644,621

## O,O-DIMETHYL PHOSPHOROTHIOATE ESTERS OF METHYL PYRAZINOLS AS INSECTICIDES

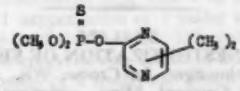
**Richard Joseph Magee, Princeton, and James Byron Lovell, Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Original application Sept. 16, 1968, Ser. No. 762,379, now Patent No. 3,505,328, dated Apr. 7, 1970. Divided and this application Feb. 6, 1970, Ser. No. 9,394**

**Int. Cl. A01n *9/36***

**U.S. Cl. 424—200** **5 Claims**

Insecticidal compounds are provided having the formula:



This is a divisional application of application Ser. No. 762,379, filed Sept. 16, 1968, and now issued as U.S. Pat. No. 3,505,328.

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3,644,622

## NOVEL POLYMETHYLENE QUINOXALINE DIOXIDES FOR TREATING RESPIRATORY DISEASES AND AS GROWTH PROMOTANTS

**James David Johnston, Old Saybrook, Conn., assignor to Pfizer Inc., New York, N.Y.**

**No Drawing. Application Oct. 18, 1966, Ser. No. 587,406, now Patent No. 3,485,836, which is a continuation-in-part of application Ser. No. 463,933, June 14, 1965. Divided and this application Apr. 9, 1969, Ser. No. 833,231**

**Int. Cl. A61k *27/00***

**U.S. Cl. 424—250** **6 Claims**

Series of 2,3-dihydro-1H-cyclopenta[b]quinoxaline-4,9-dioxides useful in the control of gram-negative infections in animals and for the promotion of weight gain and feed efficiency of animals and novel feed compositions containing said compounds.

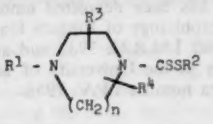
3,644,623

## DIAZEPINE DERIVATIVES OF DITHIOCARBOXYLATES AS DOPAMINE - β - HYDROXYLASE INHIBITORS

Per Arvid Emil Carlsson, Goteborg, Hans Rudolf Corrodi, Molndal, and Gosta Lennart Florwall and Svante Bertil Ross, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

No Drawing. Filed Dec. 11, 1968, Ser. No. 783,131
Claims priority, application Sweden, Dec. 14, 1967, 17,198/67
Int. Cl. A61k 27/00
U.S. Cl. 424—244 10 Claims

Piperazine and diazepine derivatives of dithiocarboxylates and disulfides having the general formula



a process for their preparation, and a method for the inhibition of the enzyme dopamine-β-hydroxylase wherein a therapeutically effective dose of a pharmaceutically acceptable preparation of a compound of the said general formula is administered orally, rectally or by means of an injection to produce a sedative effect.

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3,644,624

## METHOD OF CONTROLLING HELMINTHIASIS

Lloyd H. Conover, Quaker Hill, and James W. McFarland, Lyme, Conn., and William C. Austin, Deal, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Division of application Ser. No. 661,220, Aug. 17, 1967, now Patent No. 3,549,624, which is a continuation-in-part of application Ser. No. 515,736, Dec. 22, 1965, which is a continuation-in-part of application Ser. No. 487,654, Sept. 16, 1965, which in turn is a continuation-in-part of application Ser. No. 428,859, Jan. 28, 1965. This application Nov. 5, 1969, Ser. No. 870,750
Int. Cl. A61k 27/00
U.S. Cl. 424—251 7 Claims

The preparation of a series of cyclic amidines; namely, 2 - [ω-(2-thienyl)alkyl]-, 2-[2-(2-thienyl)vinyl]-$\Delta^2$-tetrahydropyrimidines and $\Delta^2$ - imidazolines, the N - methyl derivatives and non-toxic acid addition salts thereof, and their use as anthelmintic agents, is described.

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3,644,625

## ANESTHETIZATION OF FISH

Richard A. Schoettger, La Crosse, Wis., and Erwin W. Steucke, La Crescent, Minn., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Mar. 13, 1969, Ser. No. 807,095
Int. Cl. A61d 7/00
U.S. Cl. 424—258 1 Claim

A method for anesthetizing fish comprising exposing the fish to an aqueous solution of a combination of an alkyl aminobenzoate or the methanesulfonate salt thereof and quinaldine or quinaldine sulfate.

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3,644,626

## NOVEL PYRIDONES IN COMPOSITIONS AND METHODS FOR TREATING INFLAMMATION, PAIN AND FEVER

Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Nov. 25, 1969, Ser. No. 879,925
Int. Cl. A61k 27/00
U.S. Cl. 424—263 18 Claims

The treatment of inflammation, pain and fever utilizing compositions containing alkyl substituted pyridones, thiopyridones and pyridines.

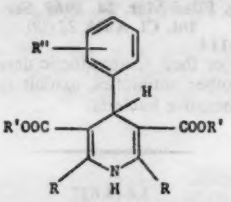
3,644,627

## PHARMACEUTICAL COMPOSITIONS AND METHODS FOR PRODUCING CORONARY DILATION WITH 4 - ARYL - 1,4 - DIHYDROPYRIDINE DERIVATIVES

Friedrich Bossert, Wuppertal-Elberfeld, and Wulf Vater, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 829,099, May 29, 1969, which is a division of application Ser. No. 712,910, Mar. 14, 1968, now Patent No. 3,485,847, dated Dec. 23, 1969. This application Nov. 20, 1969, Ser. No. 872,442
Claims priority, application Germany, Mar. 20, 1967, F 51,881
Int. Cl. A61k 27/00
U.S. Cl. 424—266 51 Claims

4-phenyl-1,4-dihydropyridines of the formula:



wherein

R is hydrogen or alkyl of 1 to 3 carbon atoms,
R′ is alkyl of 1 to 4 carbon atoms, and
R″ is hydrogen, halogen, or 1 or 2 lower alkyl, lower alkoxy, nitro, lower acylamino, lower alkylamino or amino moieties are produced by reacting benzaldehydes or substituted benzaldehydes with acyl fatty acid esters of the formula R—CO—$CH_2$—COOR′ wherein R and R′ are as above defined with ammonia.

These 4-phenyl-1,4-dihydropyridines are useful in treating diseases of the circulation, especially those concerning coronaries. They are particularly useful in the treatment of angina pectoris.

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3,644,628

## COMPOSITIONS HAVING TESTOSTERONE ANTAGONISTIC EFFECTS AND METHOD OF USING THE SAME

George Tonelli, 15 Seneca Ave., Emerson, N.J. 07630

No Drawing. Continuation-in-part of application Ser. No. 736,982, June 14, 1968, which is a continuation-in-part of application Ser. No. 628,295, Apr. 4, 1967. This application Aug. 29, 1969, Ser. No. 854,284
Int. Cl. A61v 27/00
U.S. Cl. 424—270 6 Claims

A new use for known compounds of the category 2-lower alkanoylamino-5-nitrothiazoles is described. These compounds, when administered to mammals, counteract the biological effect of testosterone on end organs.

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3,644,629

## METHOD FOR IMPROVING ANIMAL FEED EFFICIENCY AND COMPOSITIONS SUITABLE FOR USE THEREIN

Delbert W. Kolterman, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,779
Int. Cl. A61k 27/00
U.S. Cl. 424—273 7 Claims

This invention relates to the discovery that 5-[2-(methylthio)ethyl]hydantoin can be incorporated in the diet of animals to increase feed efficiency.

Also disclosed are feed compositions and feed concentrates containing 5-[2-(methylthio)ethyl]hydantoin and a process for preparing 5-[2-(methylthio)ethyl]hydantoin from ammonium carbonate monohydrate, sodium cyanide and 3-(methylthio)propanal.

3,644,630

## INDOMETHACIN SUPPOSITORIES

Donald J. Allen, Gwynedd, and Joseph V. Bondi, Collegeville, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 9, 1970, Ser. No. 44,876
Int. Cl. A61k 27/00
U.S. Cl. 424—274 3 Claims

The preparation of suppositories which contain indomethacin in a base consisting substantially of polyethylene glycols is described.

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3,644,631

## THERAPEUTIC METHODS UTILIZING ARYL PYRROL-3-YL KETONES

Irwin J. Pachter, Woodbury, and Alan A. Rubin, Rockville Center, N.Y., assignors to Endo Laboratories Inc., Garden City, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 584,762, Oct. 6, 1966. This application May 13, 1969, Ser. No. 824,284
Int. Cl. A61k 27/00
U.S. Cl. 424—274 8 Claims

Therapeutic compositions having anti-inflammatory, analgetic and antipyretic activities, and methods for relieving pain, reducing fever and alleviating inflammatory syndromes in mammals by means of such compositions, utilizing certain aryl pyrrol-3-yl ketones.

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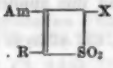
3,644,632

## HALOTHIETE-1,1-DIOXIDE AS ANTI-INFLAMMATORY AGENTS

Melvin Harris Rosen, Madison, and Herbert Morton Blatter, Springfield, N.J., assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,546
Int. Cl. A61k 27/00
U.S. Cl. 424—275 1 Claim

2-halo-3-amino-2H-thiete-1,1-dioxides, e.g. those of the formula



X=halogen
Am=dialkylamino or alkyleneimino
R=H or alkyl

exhibit antiinflammatory effects.

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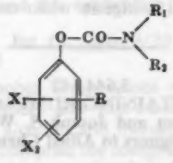
3,644,633

## METHOD FOR COMBATING SOIL INSECTS AND TERMITES

Fritz Bachmann, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,906
Claims priority, application Switzerland, Nov. 24, 1967, 16,530/67
Int. Cl. A01n 9/28
U.S. Cl. 424—278 1 Claim

The invention relates to a method of combating soil insects and termites with preparations containing as the active ingredient a carbamate of the general formula



in which $R_1$ and $R_2$ represent hydrogen or an aliphatic group; $X_1$ and $X_2$ represent hydrogen, halogen, an aliphatic or nitro group, and R is the ortho- or meta-position to the carbamyloxy group represents an aldehyde group which is acetalized with alcohols and/or thioalcohols, preferably to form a heterocyclic ring containing oxygen and/or sulfur atoms.

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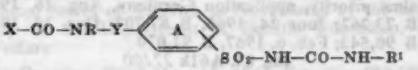
3,644,634

## BENZENESULFONYL-UREAS WITH HYPOGLYCEMIC ACTIVITY

Rudi Weyer, Frankfurt am Main, Walter Aumüller, Kelkheim, Taunus, Helmut Weber, Frankfurt am Main, Karl Muth, Kelkheim, Taunus, and Ruth Heerdt, Mannheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Application June 3, 1968, Ser. No. 733,759, now Patent No. 3,494,936, dated Feb. 10, 1970, which is a continuation-in-part of application Ser. No. 474,174, July 22, 1965. Divided and this application Nov. 14, 1969, Ser. No. 871,320
Claims priority, application Germany, Aug. 1, 1964, F 43,640; Aug. 14, 1964, F 43,750
Int. Cl. A61k 27/00
U.S. Cl. 424—275 16 Claims

Benzenesulfonyl-ureas with hypoglycemic activity having the general formula



in which

R is hydrogen, lower alkyl or phenyl-lower alkyl, $R^1$ is:

(a) alkyl, alkenyl or mercaptoalkyl having 2 to 8 carbon atoms,

(b) alkoxyalkyl or alkylmercaptoalkyl having 4 to 8 carbon atoms of which at least 2 belong to the alkylene part of the alkoxyalkyl or alkylmercaptoalkyl,

(c) phenyl-lower alkyl,

(d) cycloalkyl-lower alkyl having 7 to 9 carbon atoms of which 6 to 8 belong to the cycloalkyl part,

(e) endoalkylene-cyclohexyl, endoalkylene-cyclohexenyl, endoalkylene-cyclohexylmethyl or endoalkylene-cyclohexenylmethyl having 1 to 2 endoalkylene-carbon atoms,

(f) lower alkylcyclohexyl, lower alkoxycyclohexyl,

(g) cycloalkyl having 5 to 8 carbon atoms,

(h) cyclohexenyl, cyclohexenylmethyl,

(i) a heterocyclic ring with 4 to 5 carbon atoms and 1 oxygen atom or 1 sulfur atom as well as up to 2 ethylenic double linkages, or

(k) a heterocyclic ring linked to the nitrogen atom by means of a methylene group and containing 4 to 5 carbon atoms and 1 oxygen atom or 1 sulfur atom as well as up to 2 ethylene double linkages,

X is:

(a) thienyl or thienoxy which may contain 1 to 2 substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower alkenoxy, lower alkoxy lower alkoxy, lower phenalkoxy and aryl and a polymethylene chain of 3 to 4 carbon atoms linked by both ends to the thienyl nucleus,

(b) furyl which may contain 1 to 2 substituents selected from the group consisting of halogen and methyl,

and the thienyl, thienoxy or furyl groups may be linked either directly or by means of a hydrocarbon chain having 1 to 2 carbon atoms to the adjacent carbonyl group, and

Y is a saturated hydrocarbon chain having 1 to 3 carbon atoms

and salts thereof.

3,644,635
**METHOD AND COMPOSITIONS FOR INHIBITING MICROBIAL GROWTH**
Bryce E. Tate, Ninantic, and Robert P. Allingham, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 310,141, Sept. 19, 1963. Division of application Ser. No. 591,126, Nov. 1, 1966. This application Apr. 10, 1969, Ser. No. 834,922
Int. Cl. A01n *9/28*
U.S. Cl. 424—283 5 Claims
Inhibiting the growth of bacteria and fungi by applying to their locus certain 2-alkenylpyromeconic acids.

3,644,636
**METHOD OF INDUCING BRADYCARDIA AND SUPPRESSING TACHYCARDIAC EFFECTS OF N-ISOPROPYL-NORADRENALINE**
Herbert Koppe, Ingelheim, Albrecht Engelhardt, Mainz, Gerhard Ludwig, Lippramsdorf, and Karl Zeile, Ingelheim, Germany, assignors to Boehringer Ingelheim, G.m.b.H., Ingelheim am Rhein, Germany
No Drawing. Continuation-in-part of application Ser. No. 619,141, Feb. 28, 1967. This application May 1, 1969, Ser. No. 821,137
Claims priority, application Germany, Aug. 26, 1963, B 73,262; June 24, 1966, B 87,707; Dec. 30, 1966, B 90,543; Feb. 6, 1967, B 91,070
Int. Cl. A61k *27/00*
U.S. Cl. 424—304 3 Claims
Bradycardia compositions having N-isopropyl-noradrenaline antagonistic activity and method of inducing said activity in warm-blooded animals using as the active ingredient at least one 1-substituted phenoxy-2-hydroxy-3-N-isopropylamino propane or its nontoxic, pharmaceutically acceptable acid addition salt.

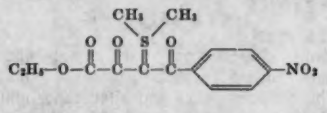
3,644,637
**FUNGICIDAL MUCONONITRILES**
Dennis Ernest Burton, Saffron Walden, Essex, England, assignor to Fisons Limited, Suffolk, England
No Drawing. Continuation-in-part of application Ser. No. 669,305, Jan. 22, 1968. This application July 17, 1969, Ser. No. 842,707
Claims priority, application Great Britain, July 18, 1968, 34,188/68
Int. Cl. C07c *121/30*
U.S. Cl. 424—304 11 Claims
Fungicidal and pesticidal compositions contain as an active ingredient a mucononitrile of the formula:

$$NC—CR^1=CR^2—CR^3=CR^4—CN$$

wherein $R^1$, $R^2$, $R^3$ and $R^4$ may be the same or different and are selected from the group consisting of hydrogen, halogen, alkyl, substituted alkyl or alkoxy. In a particular aspect of the invention compositions are adapted to release the mucononitrile in vapour form.

3,644,638
**COMPOSITIONS AND METHODS FOR RELIEVING BRONCHIAL SPASM WITH PROSTANOIC ACIDS AND ESTERS**
Marvin E. Rosenthale, Havertown, and Milton Lapidus, Rosemont, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 749,606, Aug. 2, 1968, and Ser. No. 870,990, Oct. 28, 1969. Said application Ser. No. 749,606 being a continuation-in-part of application Ser. No. 617,072, Feb. 20, 1967, and said application Ser. No. 870,990, being a division of application Ser. No. 749,606, Aug. 2, 1968. This application Aug. 24, 1970, Ser. No. 66,659
Int. Cl. A61k *27/00*
U.S. Cl. 424—305 28 Claims
Compositions comprising compounds selected from the family of prostanoic acids and esters or salts thereof and a pharmacological carrier are useful to treat bronchial spasm in warm-blooded animals and to promote free breathing, especially when administered by the inhalation of an aerosol mist.

3,644,639
**FUNGICIDAL COMPOSITION AND METHOD CONTAINING α-SUBSTITUTED SULFONIUM YLIDS**
Kenneth Wayne Ratts, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Original application May 11, 1966, Ser. No. 549,160. Divided and this application Aug. 8, 1968, Ser. No. 765,734
Int. Cl. A01n *9/24*
U.S. Cl. 424—308 2 Claims
Fungicidal compositions comprising an inert fungicidal adjuvant and a fungicidally effective amount of the compound of the formula



This invention relates to α-substituted sulfonium ylids and to processes for their preparation. This invention further relates to fungicidal compositions and to methods for the control of fungal organisms.

3,644,640
**S-SUBSTITUTED MERCAPTO-2,4-DINITROPHENYL ACETATE ACARICIDES**
Arnold D. Gutman, Pinole, and Thomas B. Williamson, Santa Clara, Calif., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Original application Oct. 6, 1965, Ser. No. 493,569. Divided and this application Sept. 29, 1969, Ser. No. 870,836
Int. Cl. A01n *9/12*
U.S. Cl. 424—311 6 Claims
A method of killing acarids by the application of S-substituted mercapto-2,4-dinitrophenyl acetates.

3,644,641
**2-(3-ANILINOPHENYL)ALKANOIC ACIDS AND DERIVATIVES THEREOF IN ANALGESIC COMPOSITIONS AND METHODS**
Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Original application Dec. 26, 1968, Ser. No. 787,192. Divided and this application Dec. 24, 1969, Ser. No. 888,075
Int. Cl. A61k *27/00*
U.S. Cl. 424—311 4 Claims
Novel alkanoic acids substituted in the 2 position by a 3-anilinophenyl group, their pharmaceutically acceptable salts, and the corresponding ester and amide derivatives. The compounds of this invention are useful as anti-inflammatory agents, and as potentiating agents useful in obtaining enhanced analgesia when combined with α-*d*-propoxyphene.

3,644,642
**UREA-CONTAINING RUMINANT FEED**
Benjamin B. Wilson and Joseph S. Wortham, Colonial Heights, Va., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,107
Int. Cl. A61k *27/00*
U.S. Cl. 424—319 6 Claims
Combination of a hydroxamic acid and ethylenediaminetetraacetic acid (EDTA) in a urea-containing rumi-

nant feed inhibits urease enzymes in the rumen from converting the urea to ammonia. The effectiveness of the hydroxamic acid in inhibiting and controlling the action of the enzymes is enhanced by incorporation therewith of the EDTA.

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3,644,643

## METHOD OF REDUCING INTRAOCULAR PRESSURE USING GLYCINE

**John C. Krantz, Jr., Gibson Island, Md., assignor to Unimed, Inc., Morristown, N.J.**

**No Drawing. Filed Oct. 13, 1969, Ser. No. 865,946**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—319** **3 Claims**

Intraocular pressure or intraocular tension is reduced in patients, for example those suffering from glaucoma or preoperatively to reduce intraocular tension prior to cataract surgery, e.g. intracapsular cataract extraction so as to facilitate the operative procedure, is reduced according to the invention by the administration to the patient of an effective amount of glycine. The glycine can be administered orally or by injection, oral administration being preferred.

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3,644,644

## METHODS OF ANESTHETIZING MAMMALS WITH N-(TERTIARY AMINO-ALKYL)-BENZAMIDES

**Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France**

**No Drawing. Original application June 19, 1968, Ser. No. 738,123. Divided and this application Jan. 12, 1971, Ser. No. 105,940**

**Claims priority, application France, June 20, 1967, 111,225; Sept. 5, 1967, 120,026**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—324** **5 Claims**

The methods of this invention utilize certain N-(tertiary amino-alkyl)-benzamides. Such benzamides are significantly more potent than cocaine, xylocaine and procaine in anesthetizing mammals. They may be administered in the form of tablets, ampoules or aerosols.

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3,644,645

## INSECT CONTROLLING COMPOSITIONS AND METHODS OF USE

**Carl Bordence, Ponte Vedra Beach, and John M. Derfer, Jacksonville, Fla., assignors to SCM Corporation, Cleveland, Ohio**

**No Drawing. Original application Jan. 9, 1967, Ser. No. 607,876, now Patent No. 3,446,843, which is a continuation-in-part of application Ser. No. 479,009, Aug. 11, 1965. Divided and this application July 26, 1968, Ser. No. 753,031**

**Int. Cl. A01n** *9/20*

**U.S. Cl. 424—325** **49 Claims**

Novel insectiphobic compositions comprising beta-dialkylaminoalkyl ethers and thio-ethers of defined non-terpenoid organic alcohols and mercaptans are described. The compositions comprise the compounds which are used in conjunction with conventional insectiphobic carriers. The compositions have been found to be effective insecticides and insect repellents and in certain instances have been found to be synergizers for conventional insecticides such as the pyrethrins and allerthrin.

3,644,646

## NON-AQUEOUS LIQUID FORMULATIONS WITH BIOLOGICALLY ACTIVE INGREDIENTS

**Bruno Sander and Heinrich Sperber, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Aug. 19, 1968, Ser. No. 753,749**

**Claims priority, application Germany, Aug. 24, 1967, P 16 42 229.0**

**Int. Cl. A01n** *9/00, 9/20, 9/32*

**U.S. Cl. 424—325** **9 Claims**

New non-aqueous liquid compositions containing biologically active ingredients and cyclic di- or triethers, and their use for controlling pests.

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3,644,647

## TREATMENT OF GLAUCOMA EMPLOYING 5-(3-METHYLAMINOPROPYL - 5H - DIBENZO[a,b] CYCLOHEPTENE

**Maurice Edward Langham, Towson, Md., assignor to the United States of America as represented by the Secretary of the Department of Health, Education, and Welfare**

**No Drawing. Filed Dec. 13, 1967, Ser. No. 690,080**

**Int. Cl. A61f** *9/00;* **A61k** *27/00*

**U.S. Cl. 424—330** **14 Claims**

Ophthalmic compositions containing 5-(3-methylaminopropyl)-5H-dibenzo[a,d]cycloheptene (or the non-toxic acid addition salts thereof), hereinafter referred to as protriptyline, either singly or in combination with a sympathomimetic amine, as well as methods of treatment of disorders such as glaucoma.

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3,644,648

## ANTIADRENAL COMPOSITIONS COMPRISING TRIPHENYLPROPYL AMINES

**Benjamin Blank, Trevose, and William A. Zuccarello, Philadelphia, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.**

**No Drawing. Original application Apr. 27, 1967, Ser. No. 634,122, now Patent No. 3,507,919, dated Apr. 21, 1970. Divided and this application Dec. 3, 1969, Ser. No. 879,959**

**Int. Cl. A61k** *27/00*

**U.S. Cl. 424—330** **10 Claims**

Pharmaceutical compositions having antiadrenal activity comprise a triphenylpropyl amine wherein one or two of the phenyl moieties is substituted. The method of producing antiadrenal activity in animals comprises the internal administration of said compositions.

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3,644,649

## METHOD OF REPELLING RODENTS USING 2,2'-THIOBIS(4,6-DI-TERT.-BUTYLRESORCINOL)

**Charles H. Fuchsman, Cleveland Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio**

**No Drawing. Filed Nov. 24, 1969, Ser. No. 879,559**

**Int. Cl. A01n** *9/00, 9/12*

**U.S. Cl. 424—337** **1 Claim**

Rodent repellents 2,2' - methylenebis(4,6-di-tert.-butylresorcinol) and 2,2' - thiobis(4,6-di-tert.-butylresorcinol), of which the latter is a novel compound are taught.

3,644,650
**SOLUTIONS OF GERMICIDAL IODINE COMPLEXES**

**Philip M. Sabatelli, Cincinnati, Ohio, Carmen R. Sarge, Fort Thomas, Ky., Edwin R. Loder, Cincinnati, Ohio, and Charles A. Brungs, Covington, Ky., assignors to Chemed Corporation, Cincinnati, Ohio**

**No Drawing. Filed June 26, 1969, Ser. No. 836,967**
**Int. Cl. A61k** *27/00*
**U.S. Cl. 424—341** **3 Claims**

Iodine complexes having germicidal properties are disclosed. The iodine complexes may be prepared by combining elemental iodine with a polyoxyalkylene iodine carrier which may include mixed polyethylene-polypropylene glycols and their monoethers. The iodine complexes so formed are useful in formulating iodophor compositions which, upon dilution, produce effective sanitizing solutions.

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3,644,651
**ALIPHATIC DIOLS AS ANALGESIC AGENTS**

**John W. Frankenfeld, Atlantic Highlands, and Horace W. Gerarde, Tenafly, N.J., assignors to Esso Research and Engineering Company**

**No Drawing. Filed Sept. 26, 1968, Ser. No. 762,972**
**Int. Cl. A61k** *27/00*
**U.S. Cl. 424—343** **5 Claims**

The present invention is concerned with the use of a number of aliphatic diols which have been tested and found to be central nervous system depressants. These compounds are readily synthesized and are useful pharmacological agents. These compounds are polyalcohols such as various aliphatic diols which are excellent analgesic and/or anesthetic agents for animals and humans.

3,644,652
**METHODS OF COMBATING NEMATODES USING HEXACHLOROBUTADIENE**

**Daniel Demozay, Villeurbanne, France, assignor to Ets Pechiney-Progil, Lyon, France**

**No Drawing. Filed May 13, 1969, Ser. No. 824,299**
**Claims priority, application France, May 14, 1968, 50,012**
**Int. Cl. A01n** *9/30*
**U.S. Cl. 424—351** **1 Claim**

The disclosure concerns a parasiticidal composition intended chiefly for the killing of nematodes containing as an active material hexachlorobutadiene

$$CCl_2{=}CCl{-}CCl{=}CCl_2$$

A method for destroying nematodes consisting of applying a lethal amount of nematode-killing hexachlorobutadiene to the nematodes.

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3,644,653
**FLAVOURED AND SCENTED PRODUCTS**

**Serge Tcheiltcheff, Vitry-sur-Seine, France, assignor to Rhone-Poulence S.A., Paris, France**

**No Drawing. Filed Apr. 4, 1969, Ser. No. 813,743**
**Claims priority, application France, Apr. 5, 1968, 147,207**
**Int. Cl. A23l** *1/22;* **A61k** *7/00, 27/00*
**U.S. Cl. 424—358** **3 Claims**

N,N-dimethyl-2-ethyl-butyramide has a minty flavour and scent which renders it useful in foods, drinks, medicines, and toilet preparations.

3,644,654
## GIANT ELECTRODE
Dieter Zollner, Erlangen, and Bernhard Reichelt, Nurnberg-Laufamholz, both of Germany, assignors to C. Conradty, Nurnberg, Germany
Filed June 11, 1970, Ser. No. 45,426
Claims priority, application Germany, June 13, 1969, P 19 30 052.8
Int. Cl. H05b 7/06
U.S. Cl. 13—18 2 Claims

A giant electrode of graphite for high-output operation of electric arc furnaces in which the electrode is provided with an electric arc stabilizing wick.

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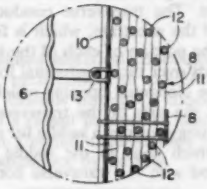
3,644,655
## RADIATION PROTECTIVE JACKET FOR A VACUUM FURNACE
Helmut Vollmer, Balzers-Mals, Liechtenstein, assignor to Balzers Patent-Und Beteiligungs-Aktiengesellschaft, Balzers, Liechtenstein
Filed July 7, 1970, Ser. No. 52,794
Claims priority, application Germany, July 10, 1969, P 19 34 965.6
Int. Cl. H05b 3/02
U.S. Cl. 13—31 7 Claims




A radiation protective jacket comprises a multiple number of layers of metal foil which are spaced apart by metal wires such as molybdenum wires. The jacket is arranged around the goods to be treated within a vacuum furnace to enclose the workspace and it is supported in the furnace on supporting elements which are held from a holder, for example, which is mounted adjacent the top of the interior of the furnace. An electrical heating coil is stretched to extend around the materials to be treated within the center of the radiation jacket.

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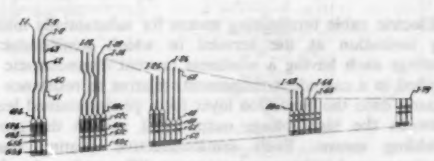
3,644,656
## TONE GENERATOR WITH VIBRATORY BARS
Clarence L. Fender, Fullerton, and Harold B. Rhodes, Anaheim, both of Calif., assignors to Columbia Broadcasting System, Inc., New York, N.Y.
Filed Aug. 4, 1970, Ser. No. 60,867
Int. Cl. G10h 3/00
U.S. Cl. 84—1.04 17 Claims



A tone generator for an electrical piano is formed of a circular cross section vibratory tine of relatively low mass and a high mass twisted inertia bar of oblong cross section, both cantilevered from a common base. When the tine is struck by the hammer of a piano action, its vibration is amplified by the resonant high mass inertia bar. A transducer associated with the tine produces an electrical signal representing a particular piano tone that is simulated by the individual tine. A number of advantages accrue from making the main body portion of the twisted high mass inertia bar of a cross section that is elongated in the plane of vibration of the tine of the tuning fork. Primarily, vibrations of the high mass inertia bar at overtones of the fundamental of the tine are substantially reduced.

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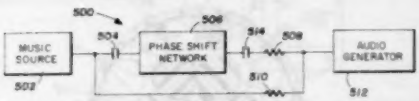
3,644,657
## ELECTRONIC AUDIOFREQUENCY MODULATION SYSTEM AND METHOD
Francis A. Miller, 6600 N.W. 39th Expressway, Bethany, Okla.
Continuation-in-part of application Ser. No. 771,900, Oct. 30, 1968, now abandoned. This application Oct. 20, 1969, Ser. No. 868,294
Int. Cl. G10h 1/04
U.S. Cl. 84—1.25 37 Claims




The invention is directed to modulation of the amplitude and frequency of an audiofrequency signal by passing the signal through at least two parallel channels, with phase-shifting circuitry in the channels providing signals of opposed phases. A low-frequency band is filtered from the signal in one of the channels and a high-frequency band is filtered from the signal in another of the channels and the signals shifted back into phase. The filtered signals are then combined into an output signal. The high- and low-frequency bands filtered from the signals are selectively varied to induce vibrato, tremolo, and other tonal effects into the output signal. In a preferred form of the invention, the high- and low-pass filters are matched so as to form substantially a 180° phase shift stage with a flat frequency response. Four stages are coupled to provide 720° of phase shift. The original audiofrequency signal is then summed with the phase-shifted signal in approximately equal proportions to produce a coordinated effect substantially duplicating that produced by a rotating speaker. The phase shift is started and stopped in a manner to duplicate the dynamic effects of starting and stopping a rotating speaker. A dual channel system is described for duplicating a multiple speaker system.

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3,644,658
## ENCASED FLUID FILLED TRANSFORMER
Albert J. Kuti, 1009 Woodview Pl., and Thomas C. Junk, 3802 Morefield Road, both of Sharon, Pa.
Filed June 4, 1970, Ser. No. 43,532
Int. Cl. H05k 7/00
U.S. Cl. 174—17 LF 7 Claims

Fluid filled electrical apparatus, such as transformers, and methods of constructing same, suitable for underground or

vault mounting. The electrical apparatus includes a metallic tank or casing formed of mild or plain carbon steel, which

has a sprayed metallic coating of corrosion-resistant material disposed on the external surfaces thereof.

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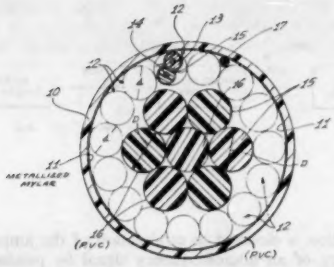
**3,644,659**
**CABLE CONSTRUCTION**

**Frank A. Campbell, Culver City, Calif., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 21, 1969, Ser. No. 878,868**
**Int. Cl. H01b *11/04***
**U.S. Cl. 174—27** **3 Claims**




A cable construction is disclosed comprising a flexible shield, conductor pairs arranged along the inner surface of the shield and filler strings in the interior thereof resiliently urging the conductor pairs into engagement with the shield.

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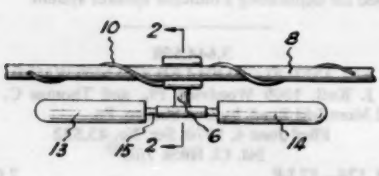
**3,644,660**
**OVERHEAD TRANSMISSION LINE AND ATTACHED VIBRATION DAMPER**

**Philip W. Dulhunty, Sefton, New South Wales, Australia, assignor to Dulmison (Australia) Pty. Limited, Sefton, New South Wales, Australia**

**Filed July 9, 1970, Ser. No. 53,619**
**Claims priority, application Australia, July 14, 1969, 57,930/69**
**Int. Cl. H02g *7/14***
**U.S. Cl. 174—42** **4 Claims**




A vibration damper for an overhead cable having a C-shaped cushioned elastomer lined suspender engaging the cable and a vibration damper suspended below it. Helical rods are wrapped around the cable and suspender to hold the suspender in place.

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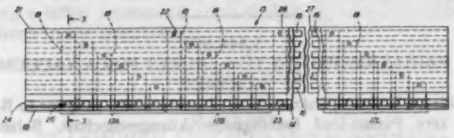
**3,644,661**
**DOUBLE-SIDED CIRCUIT HAVING TERMINAL-RECEIVING PORTIONS**

**Madhu P. Asar, Columbus, Ohio; John E. Bolin, Greensboro, N.C., and Harry L. Maddox, Columbus, Ohio, assignors to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Dec. 7, 1970, Ser. No. 95,809**
**Int. Cl. H05k *1/18***
**U.S. Cl. 174—68.5** **17 Claims**



A flexible, semirigid substrate, composed of a nonconducting material, supports a plurality of spaced, longitudinal conductors on one side thereof and a plurality of parallel, spaced, transverse conductors on the other side thereof. Through-hole connections are made through the substrate between selected longitudinal conductors and selected transverse conductors. The transverse conductors extend to a common edge of the substrate, which is formed with a longitudinal fold. The portion of each of the transverse conductors which extends over the longitudinal fold in the substrate is formed with an elongated opening which is disposed symmetrically about the axis of the transverse conductor. The longitudinal opening provides a saddle for receiving a portion of a terminal which rests in the saddle and can be subsequently soldered with the transverse conductor associated with the saddle.

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**ERRATUM**

For Class 178—5 see:
Patent No. 3,643,294

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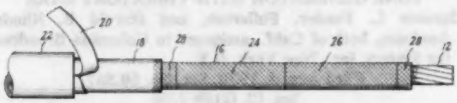
**3,644,662**
**STRESS CASCADE-GRADED CABLE TERMINATION**

**Hooshang Salahshourian, Fairfield, Conn., assignor to General Electric Company**

**Filed Jan. 11, 1971, Ser. No. 105,198**
**Int. Cl. H02g *15/02*; G01r *31/12***
**U.S. Cl. 174—73 R** **10 Claims**




Electric cable terminating means for substantially inhibiting ionization at the termini in which semiconductive coatings each having a nonlinear current characteristic are applied in a cascade arrangement, relative to resistance per square, onto the insulation layer for a predetermined length between the high-voltage output end and to the ground shielding means. Each semiconductive coating has a predetermined resistance per square different in value from an adjacent coating, or coatings, and cascaded progressively upward in value from the ground shielding means so that the semiconductive coating adjacent the shielding means has the lowermost value. A conductive coating is applied at opposite ends of the cascade onto the insulation layer to and in con-

tact with the high-voltage output end and in contact with the ground shielding means to establish electrical contact. The cascaded semiconductive coatings have sufficient resistivity so that upon application of voltage the electrical stress at the surface for said length does not exceed the ionization start level of the cable.

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3,644,663

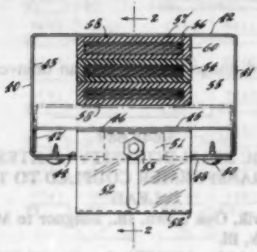
## ELECTRICAL CONDUIT SYSTEM

Elmer T. Carlson, West Granby, Conn., assignor to Broadhill Development Corporation, Granby, Conn.

Original application Aug. 8, 1969, Ser. No. 848,541. Continuation-in-part of application Ser. No. 769,485, Oct. 22, 1968, now Patent No. 3,504,097. Divided and this application Oct. 14, 1970, Ser. No. 80,609

Int. Cl. H01b 7/36

U.S. Cl. 174—88 B 5 Claims



A stack of insulated electrical conductors of rectangular external contour, each conductor preferably consisting of strip laminations, extends through a conduit which has an open position and a closed position in heat transfer relation with the insulation. Conduit envelopes are joined at the ends and conduits are suspended by hangers.

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3,644,664

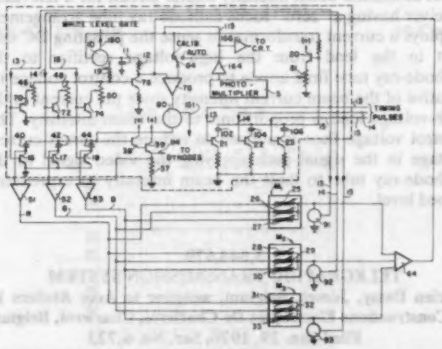
## CORRECTION LEVEL ADJUSTMENT FOR VIDEO NEGATIVE ANALYZER

Robert W. Huboi, Webster; Edward M. Waz, Hilton, and Thomas G. Seckel, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 741,008, June 28, 1968, now abandoned. This application Mar. 16, 1970, Ser. No. 19,719

Int. Cl. H04n 9/04

U.S. Cl. 178—5.2 A 4 Claims



Photographic color negatives are scanned to produce red, green and blue color signals representative of the respective red, green and blue transmission densities of the negative to control the electronic reproduction of the negative as a visual image. The visual image is created by the sequential reconstruction of the red, green and blue components of the negative scene over a predetermined time period. A logic circuit receives the red, green and blue color signals during sequential time periods and stores the red, green and blue color signals over the total time period. A color correction circuit including at least three matrixes of impedance elements receives each of the color signals to provide a sequential color correction signal for each color signal dependent upon the response of the other color signals over the total time period. The impedance elements of the matrixes may be adjusted to provide color correction signals dependent upon the various characteristics of the printer on which the negative is to be printed.

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3,644,665

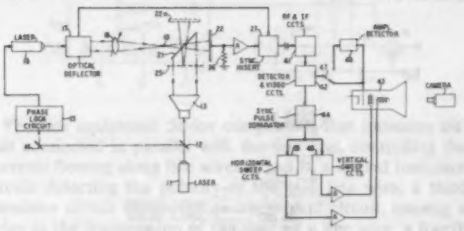
## HOLOGRAPHIC FLYING-SPOT SCANNER

Louis H. Enloe, and Arthur B. Larsen, both of Colts Neck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1969, Ser. No. 806,136

Int. Cl. H04n 9/56

U.S. Cl. 178—6.5 10 Claims



This disclosure relates to a holographic flying-spot scanner wherein a stationary collimated beam illuminates the subject and is then optically relayed via a beamsplitter to a photodetector. A scanning spot is focused an appropriate distance in front of the beamsplitter such that the locus of the virtual image thereof lies in a plane which is in front of, at, or behind, the subject or subject plane, as desired. The detected interference between the rays of the scanning spot and the beam passing through the subject is used to reconstruct a hologram of the subject. The plane of the hologram is the locus of the virtual image of the scanning spot.

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3,644,666

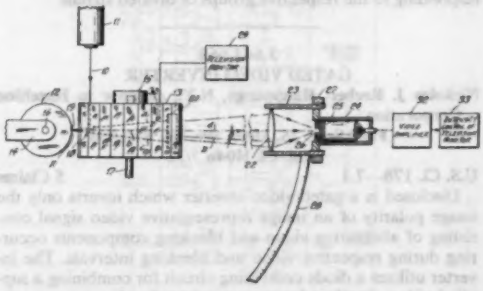
## OPTICAL RANGE DISCRIMINATOR FOR LASER TV CAMERA

Milton Green, 980 Flanders Road, Mystic, Conn.

Filed July 7, 1970, Ser. No. 52,874

Int. Cl. G01c 3/08; H04n 7/18

U.S. Cl. 178—6.8 2 Claims



An optical beam scanner having a pair of polygonal cylinders with exterior mirror faces to sweep a continuous in-

cident laser beam between particular angular limits in one direction and between particular angular limits in the transverse direction, simulating line-by-line and frame-by-frame scanning. Reflections scattered back from objects in the path of the swept beam and incident to the line-by-line scanner are redirected by the line-by-line scanner toward a photomultiplier assembly which is angularly adjustable about the line-by-line scanner for range discrimination. A television monitor, synchronized with the scanners and intensity modulated by the photomultiplier output, images any reflecting object at the selected range and within the angular sweep limits of the beam.

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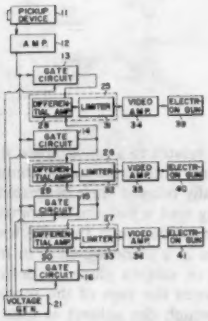
**3,644,667**

**APPARATUS FOR DISPLAYING A TEMPERATURE DISTRIBUTION PATTERN**

**Teruo Shimotsuma; Toshihiro Mori; Kazuo Sano, all of Yokohama-shi, and Seigo Ando, Kawasaki-shi, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed June 11, 1969, Ser. No. 832,219**
**Claims priority, application Japan, June 15, 1968, 43/41009**
**Int. Cl. H04n** *7/18*
**U.S. Cl. 178—6.8** **2 Claims**




An apparatus for displaying a temperature distribution pattern which comprises means for obtaining from a television camera device signals having amplitudes corresponding to the respective temperature zones involved in the temperature distribution pattern of a foreground subject, means for dividing these signals into several groups according to said temperature zones and means for displaying on the color television image receiving tube a hue distribution pattern corresponding to the respective groups of divided signals.

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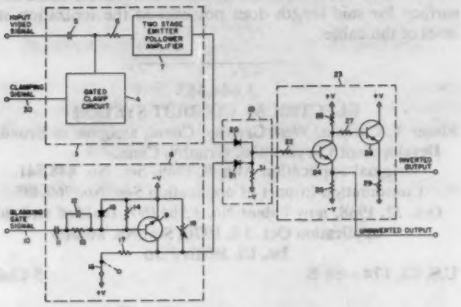
**3,644,668**

**GATED VIDEO INVERTER**

**Nicholas J. Reeber, Hauppauge, N.Y., assignor to Hazeltine Corporation**

**Filed Sept. 25, 1969, Ser. No. 860,896**
**Int. Cl. H04n** *5/22*
**U.S. Cl. 178—7.1** **5 Claims**

Disclosed is a gated video inverter which inverts only the image polarity of an image representative video signal consisting of alternating video and blanking components occurring during respective video and blanking intervals. The inverter utilizes a diode combining circuit for combining a supplied video signal and a gate signal to develop a composite video signal having the character of the supplied video signal during the video interval and the character of the gate signal during the blanking interval. The composite video signal is then inverted to produce an output video signal having the




desired inverted image polarity and an uninverted blanking component.

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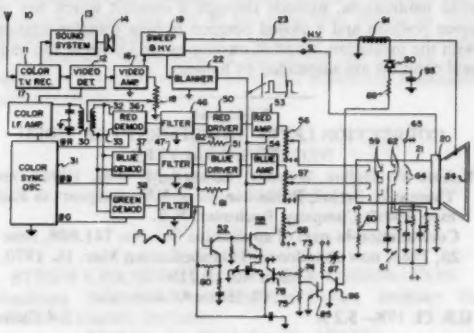
**3,644,669**

**AUTOMATIC BEAM INTENSITY LIMITER WITH A CURRENT TRANSFORMER COUPLED TO THE ULTOR LEAD**

**William H. Slavik, Oak Lawn, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed May 15, 1970, Ser. No. 37,507**
**Int. Cl. H04n** *5/44*
**U.S. Cl. 178—7.5 R** **3 Claims**




An automatic beam intensity limiter circuit for a television receiver having a "zero" focus cathode-ray tube arrangement employs a current transformer to sense the pulsating DC current in the lead from the high-voltage rectifier to the cathode-ray tube final anode to produce a control voltage indicative of the beam current intensity since the current in the high-voltage lead is proportional to the beam intensity. This control voltage then is utilized to reduce the direct current voltage in the signal path applying the video signal to the cathode-ray tube to limit the beam intensity to a predetermined level.

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**3,644,670**

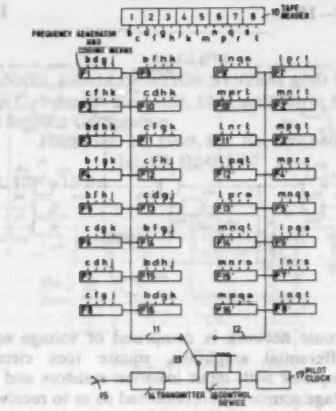
**TELEGRAPHIC TRANSMISSION SYSTEM**

**Lucien Dessy, Jumet, Belgium, assignor to Acec Ateliers De Constructions Electriques De Charleroi, Charleroi, Belgium**

**Filed Jan. 29, 1970, Ser. No. 6,723**
**Claims priority, application Belgium, Jan. 30, 1969, 69382**
**Int. Cl. H04l** *17/08*
**U.S. Cl. 178—17 B** **3 Claims**

A telegraphic transmission system for the transmission of series of bits of the same number in which each series of bits

to be transmitted is divided into two groups. The transmitter of the system comprises coding devices assigning to each even combination of bits of the first group of each series of bits a frequency chosen in a first group of frequencies for transmitting such frequency during a first moment, and assigning to each even combination of bits of the second group of each series of bits a frequency chosen in a second group of frequencies for transmitting such frequency during a second moment following the first moment and of the same duration. The coding devices assign to each odd combination of bits of the first group of each series of bits a frequency chosen in the



second group of frequencies for transmitting such frequency during the first moment, and assign to each odd combination of bits of the second group of each series of bits a frequency chosen in the first group of frequencies for transmitting such frequency during the second moment. The receiver comprises a switching device operated by a pilot clock at the rate of the moments of transmission, two identical frequency selectors to which the switching device alternatively applies the signals received by a detector associated with each selector, and a decoding device connected to both selectors for regrouping the two groups of the series of bits.

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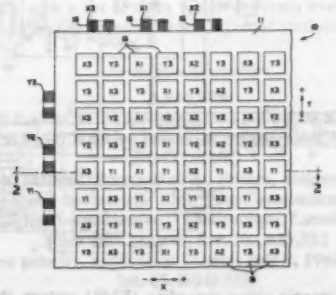
**3,644,671**

## GRAPHIC DATA ENTRY SYSTEM

**Alfred D. Scarbrough, Northridge, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.**

**Filed Oct. 21, 1968, Ser. No. 769,251**
**Int. Cl. G08c *21/00***
**U.S. Cl. 178—18** **10 Claims**



A graphic data entry system using a stylus adapted for cooperation with a data entry tablet. The tablet comprises a matrix of elements interconnected to each other and to appropriate logic circuitry so as to provide for the determination of relative stylus movement in response to the element sequences traversed by the stylus.

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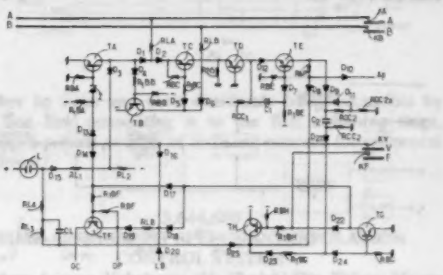
**3,644,672**

## LINE EQUIPMENT DEVICE FOR TELEGRAPH LINES

**Roger Teurnier, Rueil-Malmaison, and Claude Rousseau, Joinville-le-Pont, both of France, assignors to C. I. T.-Compagnie Industrielle Des Telecommunications, Paris, France**

**Filed Mar. 19, 1969, Ser. No. 808,409**
**Claims priority, application France, Mar. 19, 1968, 144398**
**Int. Cl. H04l *25/02***
**U.S. Cl. 178—69 G** **10 Claims**



The line equipment device comprises a first transistor circuit connected in parallel with the said line, controlling the currents flowing along line wires A and B, a second transistor circuit detecting the polarity of the said line wire, a third transistor circuit connected to the second circuit, causing a delay in the transmission of the state of a line wire, a fourth transistor circuit connected to the first circuit indicating to selecting devices the state of readiness for operation or occupancy of the line equipment, and a fifth transistor circuit connected to the fourth circuit for use in case of line outings.

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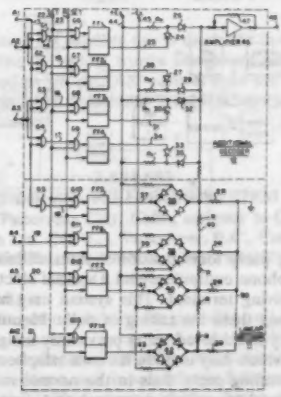
**3,644,673**

## PCM TRANSMISSION SYSTEM UTILIZING TWO LINEAR DECODERS

**Shunroku Sasaki, Yokohama-shi, and Shizuo Takebayashi, Kawasaki-shi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Aug. 8, 1969, Ser. No. 848,655**
**Claims priority, application Japan, Aug. 13, 1968, 43/57755**
**Int. Cl. H04l *15/24***
**U.S. Cl. 178—88** **1 Claim**



A dynamic range of decoding PAM signals is divided into a plurality of ranges by decoding the range of the plurality of

ranges which is required to have the highest precision with a number of bits less than the number of bits of PCM input signals to provide an output signal. Bias voltage is applied to the output signal to decode the other ranges of the plurality of ranges.

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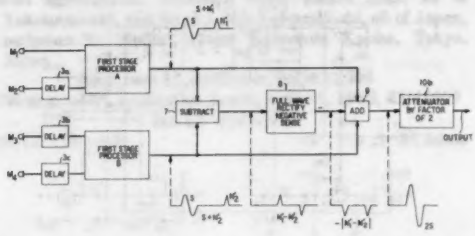
**3,644,674**
**AMBIENT NOISE SUPPRESSOR**

**Olga M. M. Mitchell, Summit; Carolyn Ross, Berkeley Heights, and Robert L. Wallace, Jr., Warren Township, Somerset County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed June 30, 1969, Ser. No. 837,699**
**Int. Cl. H04b *15/00***
**U.S. Cl. 179—1 P** **7 Claims**




Signals from a desired source, such as a person speaking, are enhanced relative to unwanted ambient sound by a speech processor that includes an array of microphones arranged at equal distances from the desired source. The unwanted sound, being "off-center," arrives nonconcurrently at the individual microphones. The processor continuously arranges the instantaneous microphone outputs in order of their relative energy contained, and selects as its output some one of the microphone outputs that is intermediate in the instantaneous ranking.

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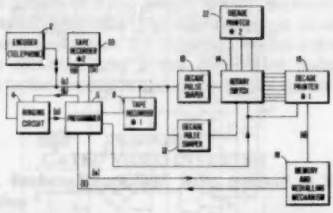
**3,644,675**
**POLLING METHOD UTILIZING TELEPHONE TRANSMISSION AND RECORDING SYSTEM**

**Frank W. Watlington, "Coralita", Pembroke, Bermuda**

**Continuation-in-part of application Ser. No. 816,260, Apr. 15, 1969, now abandoned. This application June 4, 1970, Ser. No. 43,487**
**Int. Cl. H04m *11/10***
**U.S. Cl. 179—2 AS** **8 Claims**




A calling party identification system utilizing the normal public telephone equipment and a special electronic package at the receiving terminal. This system may have numerous usages among them the taking of polls. Identification of the calling party is achieved using previously assigned digital information which may include his own telephone number and which the calling party dials in the normal manner into the electronic package which processes this digital information and may either dial back the calling party who has previously been instructed to "hang up," to ensure that the call is originating from the telephone number dialed, or other assigned numerals (or the telephone subscriber's own telephone number) are correlated with those recorded in a memory bank. If any one or all of these checks pass, the calling party is instructed to dial his voting numerals; if they do not, the call is rejected.

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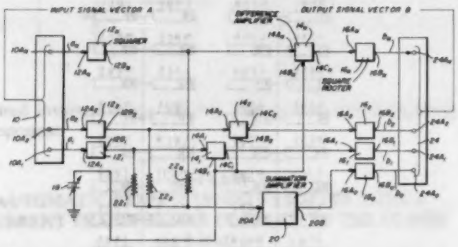
**3,644,676**
**MULTICHANNEL SIGNAL NORMALIZER**

**Victor W. Bolie, Stillwater, Okla., assignor to Oklahoma State University, Stillwater, Okla.**

**Filed Jan. 9, 1970, Ser. No. 1,810**
**Int. Cl. G10l *1/00***
**U.S. Cl. 179—15 A** **1 Claim**




An electronic network is comprised of voltage squaring circuits, differential amplifiers, square root circuits, a summing amplifier with input isolation resistors and an adjustable voltage source, interconnected so as to receive at an input terminal strip a set of *n* parallel and time-varying input signals, collectively identifiable as an input signal vector, and to convert said input signal vector into a set of *n*+1 parallel and time-varying output signals collectively identifiable as an output signal vector, said output signal vector having the property of being of fixed length in its hyperspace of *n*+1 dimensions and also the property of containing all of the information carried in the input signal vector.

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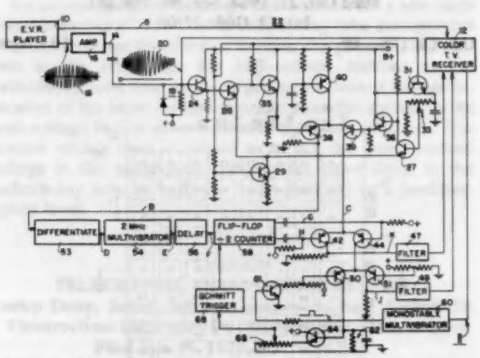
**3,644,677**
**SIGNAL DEMODULATING SYSTEM**

**Gildo Cecchin, Niles, and Francis H. Hilbert, River Grove, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 9, 1970, Ser. No. 17,429**
**Int. Cl. H04j *3/06***
**U.S. Cl. 179—15 AW** **8 Claims**




In an electronic video recording (EVR) system, the color information is encoded in the form of pulse width modulated rectangular pulses derived from the EVR scanning pattern, with the two color signals required being provided in an in-

terleaved pattern by time division multiplex. The leading edge of each of the pulses conveys the necessary synchronizing information and the trailing edge is modulated to represent the saturation of the particular hue to which the pulse corresponds. A demodulator for recovering the color information reconstructs and inverts the color information signal which then is applied to a demodulator gate in the form of a differential amplifier controlled by delayed switching pulses synchronized with the information signal to alternately enable one or the other of the outputs of this gate. A circuit is provided for resetting the phase of the flip-flop controlling the switching of the demodulator gate at the beginning of each line if the phase of the input signal is not proper.

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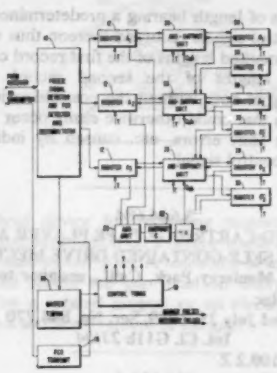
**3,644,678**

## CHANNEL REALLOCATION SYSTEM AND METHOD

**William G. Schmidt, Rockville, Md., assignor to Communications Satellite Corporation**

**Filed Mar. 21, 1969, Ser. No. 809,340**
**Int. Cl. H04j** *3/00*
**U.S. Cl. 179—15 BA** **5 Claims**



In a time division multiple access communications system having multiple ground stations and a satellite for communicating signals between ground stations, the channels are periodically reallocated among the several ground stations based upon the traffic load at the time of reallocation. At the reallocation time, a slack group of channels, representing presently available channels, are distributed among the ground stations. The time of the periodic transmission (hereinafter referred to as transmission burst) from each ground station is shifted in time with respect to the time of the transmission burst from a reference station to accommodate the reallocation of channels. The transmission burst times of all stations are not shifted simultaneously but are shifted in accordance with a set of rules which prevents overlapping between transmission bursts from adjacent stations.

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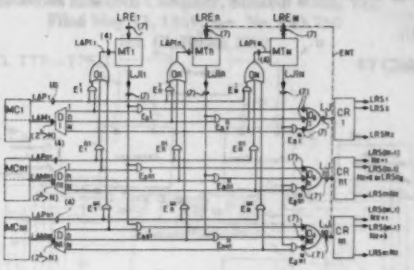
**3,644,679**

## HIGH-CAPACITY CONNECTING NETWORK HAVING BLOCKING CHARACTERISTICS FOR TIME-DIVISION SWITCHING

**Francois Tallegas, Perros-Guirec, France, assignor to C.I.T.-Compagnie Industrielle Des Tele-Communications, Paris and Societe Lannionnaise D'Electronique, Lannion, France**

**Filed July 7, 1969, Ser. No. 839,551**
**Claims priority, application France, July 5, 1968, 158143**
**Int. Cl. H04j** *3/00*
**U.S. Cl. 179—15 AQ** **4 Claims**

A connection network having blocking which is formed like a perfect linked system including a first switching stage consisting of a certain number of buffer storages with their addressing and reading systems, as well as a second switching stage consisting of gates associated with a certain number of distributors, the two switching stages being connected



together by links and each distributor being accessible by only one link connecting it to the first switching stage, whereas a certain number of links are reserved for reciprocal overthrow.

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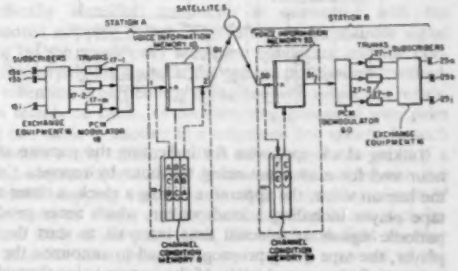
**3,644,680**

## TIME-ASSIGNMENT SPEECH-INTERPOLATION CONTROL SYSTEM

**Kitsutaro Amano, Yokohama-shi; Chuichi Ota, Tokyo; Masao Hashimoto, Kanagawa-ken; Hisao Kanzaki, Tokyo; Yasuhiko Sakamoto, Kawasaki-shi, and Nobuyuki Yasoshima, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Sept. 19, 1969, Ser. No. 859,285**
**Claims priority, application Japan, Sept. 25, 1968, 43/69607**
**Int. Cl. H04j** *5/00*
**U.S. Cl. 179—15 AS** **7 Claims**



A TASI system for satellite use is disclosed in which voice signals from the individual trunks are stored prior to being transmitted and in which TASI control data are transmitted in a frame preceding the frame in which associated speech data are transmitted.

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**3,644,681**

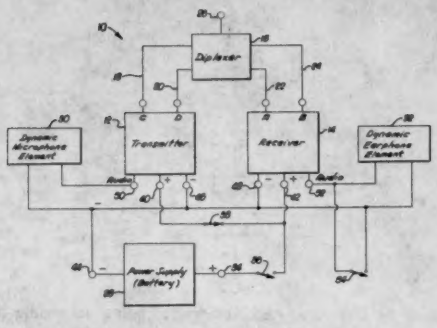
## CORDLESS TELEPHONE SYSTEM

**Dale E. Rice, Panorama City, Calif., assignor to Cardwell Oil Corporation Ltd. (N.P.L.), Vancouver, B.C., Canada**

**Filed Feb. 10, 1969, Ser. No. 798,090**
**Int. Cl. H04q** *7/04*
**U.S. Cl. 179—41 A** **5 Claims**

A telephone system wherein the portable unit appears and functions the same as a conventional telephone, but is cordless, with no direct electrical or mechanical connection to the telephone lines, and is accordingly fully mobile, as for example to any desired place within a home or office. A telephone line termination or base unit forming a part of the system connects to the telephone line, being fully compatible

with existing telephone line and central office equipment, and is coupled to the portable unit through a duplex radio system. The radio transmitter of the portable unit is keyed on by the hook-switch, and relay means in the base unit is actuated in response to this carrier frequency to connect the base unit to the telephone line and key on the base unit transmitter, thereby establishing a complete DC path for signalling and a complete audio path for conversation.

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**3,644,682**

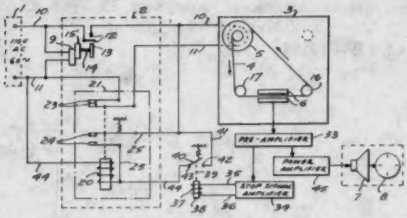
**TALKING CLOCK APPARATUS**

**Arthur R. Parilla, P.O. Box 127, Mountain Lakes, N.J.**

**Filed Aug. 5, 1968, Ser. No. 750,030**

**Int. Cl. G11b** *15/18, 27/22*

**U.S. Cl. 179—100.1 C** **1 Claim**




Talking clock apparatus for indicating the passage of the hour and for also announcing the hour by reproduction of the human voice, the apparatus having a clock, a timer and a tape player including a loudspeaker, which timer produces periodic signals at selected time intervals to start the tape player, the tape being preprogrammed to announce the time sequentially by reproduction of the human voice through the loudspeaker and being synchronized with the actual local standard time so as to repeat itself with appropriate time announcements throughout the desired operating cycle. Displacement of the tape itself through the tape player is used to stop the tape player at the end of each announcement and before the next announcement is due to start, so that the time announcement will always remain in phase with the local standard time indefinitely. If desired, the tape player may be concurrently used for entertainment, or other purposes, instead of as a talking clock, at the choice of the owner.

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**3,644,683**

**PROCESS AND APPARATUS FOR MARKING AND EDITING OF ELONGATED RECORD CARRIERS**

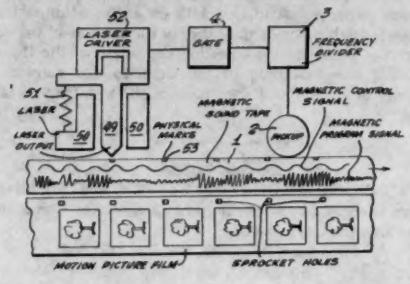
**Edward H. Braun, 6603 Old Stage Road, Rockville, Md.**

**Filed May 7, 1969, Ser. No. 822,487**

**Int. Cl. G11b** *23/42, 31/00*

**U.S. Cl. 179—100.2 B** **12 Claims**

A method and apparatus for marking a first elongated record carrier to facilitate its editing in conjunction with the editing of a second record carrier, the two record carriers bearing information that is to be synchronously reproduced. The first record carrier has both a program signal and a control signal recorded thereon. The control signal is conventionally used to control the rate of information reproduction from the second carrier during playback. The first record carrier is physically marked in a humanly sensible form at precise intervals of length bearing a predetermined relationship to the control signals recorded thereon thus correlating predetermined marked lengths of the first record carrier with predetermined lengths of the second record carrier to facilitate editing of both without the possible serious loss of synchronization that could otherwise easily occur due to cumulative phase shift errors, etc. caused by indiscriminate splicing of the control signal.

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**3,644,684**

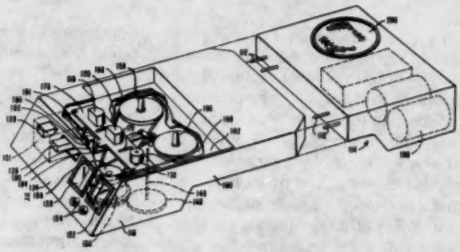
**CASSETTE TO CARTRIDGE TAPE PLAYER ADAPTER UNIT WITH SELF-CONTAINED DRIVE MECHANISM**

**Tom T. Tsuji, Monterey Park, Calif., assignor to California Auto Radio, Inc.**

**Filed July 25, 1969, Ser. No. 844,770**

**Int. Cl. G11b** *23/04*

**U.S. Cl. 179—100.2 Z** **8 Claims**



For a preexisting player system having a recess for receiving a magnetic tape cartridge, an adapter unit for playing and recording on magnetic tape cassettes is arranged to cooperate with both the mechanical drive and the electrical playback parts of the preexisting system. A housing having a portion configured to register within the cartridge-receiving recess includes an upper cassette insert position, for top-loading of a cassette tape in operative relation to a takeup drive spindle and a tape drive capstan. When the unit is inserted into the recess of the preexisting system, both the adapter capstan and takeup reel are rotated. Rotational power may be derived through a belt drive system connected with an internal roller in engagement with the capstan of the preexisting system. To record, signals from a microphone are amplified within the unit. During playback, signals derived from the playback head are preamplified within the adapter unit and energize the existing playback system through a transducer magnetically coupled to the cartridge playback

head. Electrical power may be derived from the preexisting system.

The unit may alternatively contain its own drive motor, powered from the preexisting system in compact configurations having a portion registrable within the cartridge receptacle and a compact protruding portion permitting cassette top loading. Adapter units may be equipped with their own battery pack, amplifiers and loudspeakers to function as a cassette tape record and playback system outside of the preexisting tape cartridge playback system.

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**3,644,685**

## MANUAL MAGNETIC RECORDER

**Oliver Moussette, New York, N.Y., assignor to M.G. Dynamics, Inc., New York, N.Y.**

**Filed Aug. 6, 1969, Ser. No. 847,846**
**Int. Cl. G11b** *5/12, 5/36, 27/02*
**U.S. Cl. 179—100.2 B** **4 Claims**

A handheld device for recording magnetic cueing and starting signal information on a magnetizable surface such as used on motion-picture film. A recording head is passed over the film and across the gap head an alternating mmf. is generated by a rotated magnet or an electromagnetic coil synchronized to the movement of the gap.

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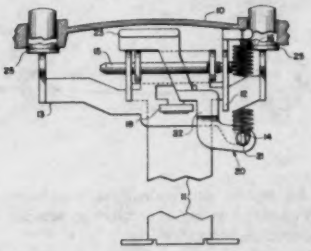
**3,644,686**

## TELEPHONE SET SWITCH-HOOK STOP

**James McKinnon Kilpatrick, and Gerd Kuhfus, both of London, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada**

**Filed Nov. 5, 1970, Ser. No. 87,149**
**Int. Cl. H04m** *1/08*
**U.S. Cl. 179—161** **2 Claims**



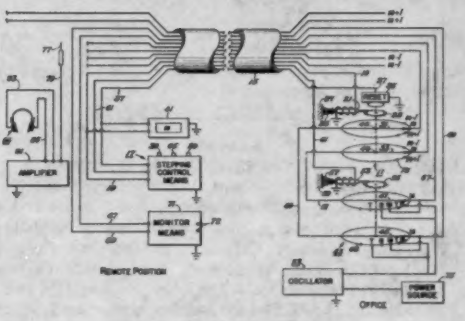
A switch-hook stop for use in a telephone set switch-hook assembly which is operated by means of a force applied from the weight of a handset. When the housing is removed the switch-hook stop can be pivoted to place the switch-hook assembly in an onhook position. Replacing the housing automatically pivots the switch-hook stop out of the way and allows the switch-hook assembly to return to the off-hook position and to function normally thereafter.

**3,644,687**

## CONDUCTOR IDENTIFICATION IN MULTICONDUCTOR MEANS

**Samuel E. Richards, Jr., Kansas City, Mo., assignor to Communications Research Company, Mineral Wells, Tex.**

**Filed May 12, 1969, Ser. No. 823,750**
**Int. Cl. H04m** *3/00*
**U.S. Cl. 179—175.3** **17 Claims**




This specification discloses an improvement in method and apparatus for identifying at a remote position conductors in a multiconductor means having the conductors identified at one end. The improvement is characterized by sequentially stepping by control signals from the remote position a sequential stepping switch onto contacts to which the identified conductors at the one end are connected, until a specifically identified conductor is connected with the sequential stepping switch. Thereafter, an identifiable signal is put on the specifically identified conductor and the conductor carrying the signal at the remote position is identified. The invention is particularly described with respect to repairing a telephone cable, or reconnecting groups of wire pairs from one cable to another in a telephone line system. In such telephonic work, ordinarily, it is advantageous to employ a second sequential switching device in conjunction with the sequential stepping switch to be able to monitor a pair of conductors, or wires, and to thereafter check out each individual wire of the pair. Also, disclosed is a field monitor unit to assist the repairman in maintaining a record of the particular conductor onto which the sequential stepping switch has been actuated. Other aspects are also described; such as, a flip-flop mode of operation in which correlated pairs of wires in a multiwire cable are identified for immediate changing of wires in a group with consequent lessening of chance of error.

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**3,644,688**

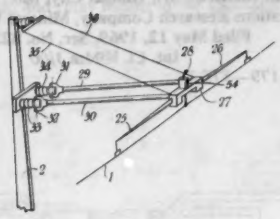
## OVERHEAD ELECTRIC SUPPLY SYSTEMS FOR VEHICLES

**Arnold Tustin, Tring, and Richard Geoffrey Sell, Rugby, both of England, assignors to British Railways Board, London, England**

**Filed Jan. 12, 1970, Ser. No. 2,164**
**Claims priority, application Great Britain, Jan. 15, 1969, 2,414/69**
**Int. Cl. B60m** *1/234*
**U.S. Cl. 191—40** **10 Claims**

A trolley wire overhead electric supply system, for supplying power for the propulsion of electric vehicles, comprises a contact wire which is directly supported by each supporting

mast. At points remote from the masts the contact wire is additionally supported by soft elastic support members to provide a lifting force on the contact wire partially compensating for the weight of the contact wire.



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**3,644,689**

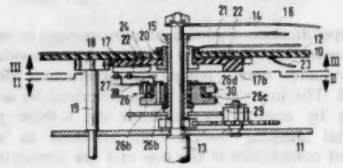
**ELECTRIC SIGNALING DEVICE FOR ALARM CLOCKS**

**Friedrich Assmus, Schramberg, Wurttemberg; Hans Flaig, Schramberg-Sulgen, Wurttemberg; Dieter Dietrich, Lauterbach, Wurttemberg, and Leo Hartner, Aichhalden, Wurttemberg, all of Germany, assignors to Gebruder Junghans G.m.b.H., Schramberg, Wurttemberg, Germany**

**Original application Oct. 4, 1967, Ser. No. 672,819, now Patent No. 3,534,543. Divided and this application Sept. 22, 1970, Ser. No. 74,313**

**Int. Cl. H01h** *19/58, 21/78*

**U.S. Cl. 200—11 J** **5 Claims**



An electric signaling device for battery alarm clocks having a switching device with a double contact and a common contact element and two separate contact elements cooperating with the common contact element. The separate contact elements are arranged in stepped relation and the contacts being operable by the clock movement.

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**3,644,690**

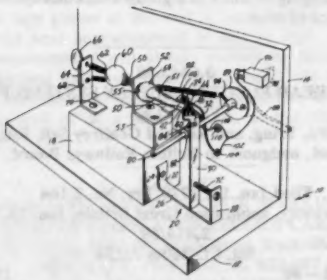
**SAFETY SWITCH TO INTERRUPT AN ELECTRICAL CIRCUIT IN CASE OF COLLISION**

**Pietro Panettieri, 4 East Britannia Street, Taunton, Mass.**

**Filed May 14, 1970, Ser. No. 37,221**

**Int. Cl. H01h** *35/14*

**U.S. Cl. 200—61.5** **8 Claims**



Safety switch apparatus connected to motor vehicle ignition which is automatically disconnected by force of an impact resulting from a vehicle collision, the disconnection being effected by movement of a weight connected to one contact member. Mounts support two contact members and permit movements of the latter to and from each other. Reset apparatus restores contact of said two members by a simple movement.

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**3,644,691**

**LIQUID LEVEL INDICATOR INSTRUMENT**

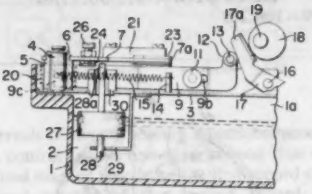
**Shigeru Suzuki, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Apr. 24, 1970, Ser. No. 31,628**

**Claims priority, application Japan, Apr. 25, 1969, 44/32509**

**Int. Cl. H01h** *35/18*

**U.S. Cl. 200—84 R** **10 Claims**



The invention provides an improved float-type liquid level instrument wherein when a liquid level is higher than or at a predetermined level, a rod extending from a float moves into the path of a continuously driven switch-actuating means so that the latter is retained in inoperative position, but when the liquid level falls below the predetermined level, the rod moves away from the path so that the switch-actuating means continuously moves between a switch-actuating position and the inoperative position, whereby the switch is intermittently closed and opened, thereby generating electrical signals. As a result, a more rigid and larger switch having a longer life may be advantageously employed and the operation becomes more reliable and precise than with prior instruments since a stronger force may be applied through switch-actuating means to the switch.

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**3,644,692**

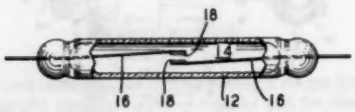
**OSMIUM PLATED CONTACTS**

**Lawrence Greenspan, New York, N.Y., assignor to Engelhard Minerals & Chemicals Corporation**

**Filed Oct. 9, 1970, Ser. No. 79,662**

**Int. Cl. H01h** *1/66, 1/02*

**U.S. Cl. 200—166 C** **4 Claims**



Contacts for use in nonoxidizing atmospheres are electroplated with a thin coating of osmium to provide longer life and more reliable performance.

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**3,644,693**

**NONSTICKING RELAY CONTACTS**

**Sheldon S. Bitko, Cherry Hill, N.J., assignor to Fifth Dimension, Inc., Princeton, N.J.**

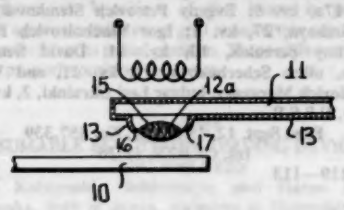
**Filed Nov. 26, 1969, Ser. No. 880,128**

**Int. Cl. H01h** *1/08*

**U.S. Cl. 200—166 C** **8 Claims**

A mercury relay having nonsticking mercury wettable surfaces, one of the surfaces carrying a button of mercury wetta-

ble material surrounded by a rim of nonmercury wettable material, preferably tantalum, which extends beyond the button and forms a physical barrier against physical impact between the mercury wettable surfaces.

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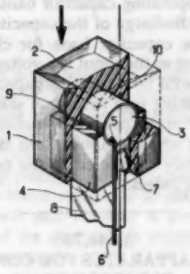
**3,644,694**

## PUSHBUTTON CONTROLLING DEVICE

**Jean Morin, and Gerard Desperrier, both of Saint-Marcellin, France, assignors to Societe d'Appareillage Electrique Saparel, Saint-Marcellin, France**

**Filed Apr. 24, 1970, Ser. No. 31,636**
**Claims priority, application France, Apr. 30, 1969, 6913937**
**Int. Cl. H01h 9/16**
**U.S. Cl. 200—167 R** **4 Claims**




A pushbutton controlling device having two states obtained by manipulation of the single pushbutton comprises, at its end, a transparent window and has a hollow part closed at its base by an inner part and carries an indicating part comprising two zoned reference marks corresponding to the starting and stopping of the device. The pushbutton is used for controlling electrical cutout devices, and also for controlling mechanical, pneumatic or hydraulic elements.

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**3,644,695**

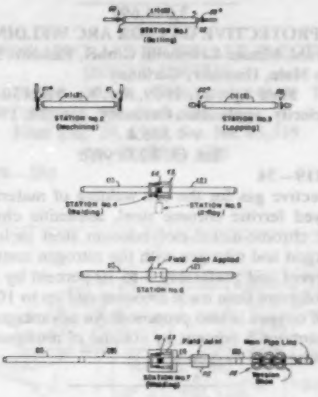
## METHOD AND APPARATUS FOR JOINING PIPE SECTIONS AND FORMING A PIPELINE

**Robert A. Shuey, Jr., 4405 Highland Drive, Dallas, Tex., and John E. Bartley, 666 Bay View Drive, Aptos, Calif.**

**Filed June 18, 1970, Ser. No. 47,341**
**Int. Cl. H05b 5/00; B23k 31/06**
**U.S. Cl. 219—8.5** **11 Claims**

A method and apparatus for forming a pipeline to be layed from a vessel below the surface of a body of water, the apparatus having means for causing outer opposite end portions of each pipe section to be of circular form and of larger interior diameter than the intermediate portions of the pipe sections, means for machining and finishing the opposite circular end surfaces of the pipe sections so that the end surfaces of two sections which are to be welded will have the proper close fit, welding the two end portions of the two pipe sections by inducing electric currents therein while holding the two end portions together under pressure in the absence of air.

A method of forming a long-length pipeline from individual pipe sections which includes forming the end portions of each pipe into true circular configuration and of larger internal diameter than the intermediate portion of the pipe section, finishing the circular end surfaces of each pipe section, bringing the two circular end surfaces of two pipe sections into contacting and concentrically aligned relationship, excluding air from the contacting end surfaces of the two pipe sections while heating the adjacent end portions of the two pipe sections and holding the end surfaces of the two pipe sections together under pressure to cause the end portions to be welded to one another, the welded portions of the pipe providing an internal annular upset which is not of smaller internal diameter than the normal internal diameter of the pipeline. The method may also include the step of welding a pair of sections of pipe to one another and then connecting the pair of joined sections to an end of a pipeline extending from the vessel into a body of water by apparatus which is movable with the pipeline relative to the vessel.



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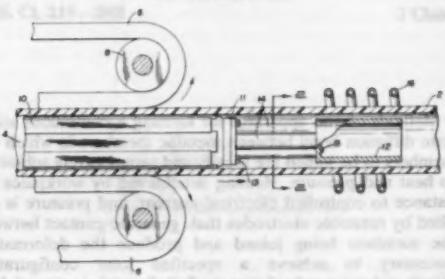
**3,644,696**

## MEANS FOR SMOOTHING THE INSIDE SURFACE OF PLASTIC HOSE

**Philip G. Magner, Jr., and Robert W. Mitten, both of Wabash, Ind., assignors to The General Tire & Rubber Company**

**Filed Aug. 28, 1970, Ser. No. 68,060**
**Int. Cl. H05b 5/00, 9/06**
**U.S. Cl. 219—10.57** **11 Claims**



The interior surface of thermoplastic hose may contain small crevices, patterns and undercuts which serve to increase the frictional resistance to flow of material through the hose, and which provide sites for the accumulation of material transported therethrough. This is particularly true of plastic hose that is sized and calibrated on a mandrel covered

with thin moving tapes which leave tape impressions and ridges on the inside of the hose. This problem is solved by the present invention which utilizes a radiation body which is supported inside of an axially moving hose and which is heated by electrical induction. The heat radiated from the body softens the inside of the hose and allows the surface tension of the plastic to smooth the interior of the hose. Various means are described for anchoring or supporting the radiation body within the hose.

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3,644,697

## PROTECTIVE GAS FOR ARC WELDING

Alfred Krahl, Messer Griesheim GmbH, Landstr. 300, Frankfurt am Main, Hanauer, Germany

Filed Apr. 21, 1969, Ser. No. 818,150
Claims priority, application Germany, Apr. 27, 1968, P 17 65 306.4
Int. Cl. B23k 9/16
U.S. Cl. 219—74 9 Claims

A protective gas for the arc welding of materials such as high-alloyed ferritic chrome steel, austenitic chrome-nickel steel and chrome-nickel-molybdenum steel includes a mixture of argon and nitrogen with the nitrogen content being 1 to 20 percent and preferably 5 to 10 percent by volume. An addition of more than trace amounts and up to 10 percent by volume of oxygen is also proposed. An advantageous form of the gas contains 5 percent by volume of nitrogen and 3 percent by volume of oxygen.

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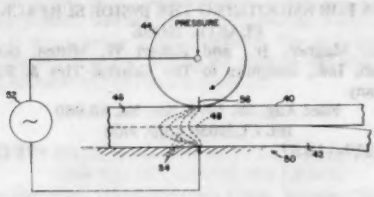
3,644,698

## METALLURGICAL BONDING AND FORMING PROCESSES AND APPARATUS

Arthur G. Metcalfe, San Diego, and Fred K. Rose, Chula Vista, both of Calif., assignors to International Harvester Company, San Diego, Calif.

Filed Sept. 8, 1969, Ser. No. 856,526
Int. Cl. B23k 11/06
U.S. Cl. 219—83 17 Claims



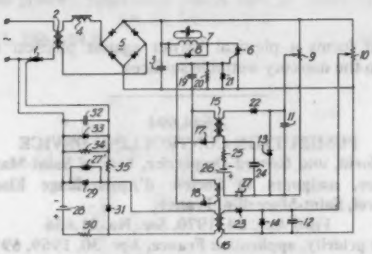

Methods of and apparatus for forming a continuous solid-state diffusion bond between metallic members in which the members to be joined are locally and progressively subjected to heat and pressure. Heating is achieved by workpiece resistance to controlled electrical current, and pressure is applied by rotatable electrodes that: generate contact between the members being joined and produce the deformation necessary to achieve a specified joint configuration therebetween; supply the controlled electric current to heat the workpiece locally and progressively; and are maintained at a temperature which results in essentially isothermal local conditions in the workpiece. Preferably, controls capable of regulating the bonding temperature are provided to insure that a uniform joint is produced. Methods of and apparatus for forming metallic members with and without bond formation by the techniques just described.

3,644,699

## CONDENSER SPOT-WELDING MACHINE

Sergei Nikolaevich Mescheryak, ulitsa Yanvarskogo Vosstania, 17a, kv. 6; Evgeny Petrovich Stemkovsky, ulitsa Brigadirskaya, 27, kv. 1; Igor Vladimirovich Pentegov, Zadorzhny pereulok, 13, kv. 14; David Semenovich Vorona, ulitsa Scherbakova, 51, kv. 21, and Vladislav Eduardovich Moravsky, bulvar Lesi Ukrainki, 2, kv. 50, all of Kiev, U.S.S.R.

Filed Sept. 12, 1969, Ser. No. 857,339
Int. Cl. B23k 11/26
U.S. Cl. 219—113 3 Claims



A condenser spot-welding machine, comprising: a rectifier unit to charge an operating capacitor bank; two gates one of which ensures the discharge of the capacitor bank, the other one connecting the capacitor bank for charging; a control unit wherein serving as the input is a voltage level setter connected in parallel with the operating capacitor bank, the output being an actuating unit acting on said gates, while said voltage level setter in the control unit consists of at least two voltage dividers to whose outputs there are coupled shaping capacitors alternately connected to the control unit circuits shaping the control pulses.

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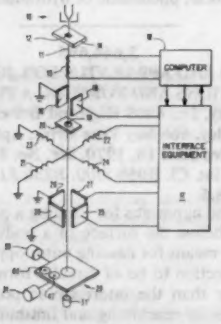
3,644,700

## METHOD AND APPARATUS FOR CONTROLLING AN ELECTRON BEAM

Robert W. Kruppa, Hopewell Junction; Edward V. Weber, and Ollie C. Woodard, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1969, Ser. No. 884,900
Int. Cl. B23k 9/08
U.S. Cl. 219—121 EB 51 Claims




A square-shaped electron beam is stepped from one predetermined position to another to form a desired pattern on each chip of a semiconductor wafer to which the beam is applied. For each chip to which the beam is applied, the position of the chip relative to a predetermined position is deter-

mined and the distance in these positions is utilized to control the position of the electron beam to insure that the desired pattern is formed on each of the chips separately. Furthermore, the position of the beam is periodically checked against a calibration grid to ascertain any deviations in the beam from its initial position. These differences are applied to properly position the beam.

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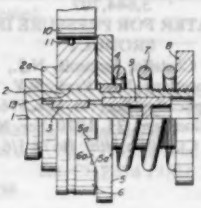
3,644,701

## CONSUMABLE ELECTRODE FEEDING DEVICE FOR ARC WELDERS

Makoto Kobayashi, Nishinomiya, and Haruo Miyahara, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1970, Ser. No. 38,843
Claims priority, application Japan, May 26, 1969, 44/42362
Int. Cl. B65h 17/20
U.S. Cl. 219—130 2 Claims



A friction clutch is provided to mechanically engage or disengage a feed roller for feeding a consumable electrode and a torque-transmitting means for transmitting the torque of a feed roller driving motor to said feed roller therethrough, with or from each other. The friction clutch is normally being held in an engaged position but is brought into a disengaged position when the travel resistance to said consumable electrode has increased and reached a predetermined value, whereby feeding of the electrode is stopped and buckling of the electrode is prevented.

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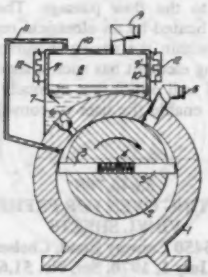
3,644,702

## VACUUM PUMP DESIGNED AS DISPLACEMENT PUMP

Marcel Kohler, Balzers, Liechtenstein, assignor to Balzers Patent-und Beteiligungs Aktiengesellschaft, Balzers, Liechtenstein

Filed Mar. 27, 1970, Ser. No. 22,580
Claims priority, application Germany, Mar. 31, 1969, P 19 16 394.1
Int. Cl. H05b 1/00
U.S. Cl. 219—201 5 Claims



In a vacuum pump designed as a displacement pump for drawing off vapor-containing gases and having a discharge point communicating with a storage vessel having an outlet aperture for the pumped gases and containing a supply of sealing fluid covering a discharge valve, heating means are provided to heat at least that portion of the wall of the storage vessel located above the level of the sealing fluid therein. The heating means may include a double jacket heated by a through-flowing heating medium, or may be an electric heating jacket surrounding the upper portion of the storage vessel. A line may be provided to return sealing fluid from the storage vessel into the pump, this line being in heat-conducting relation with that portion of the vessel wall located above the fluid level.

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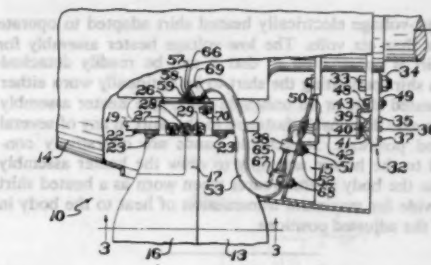
3,644,703

## LEAD FOR AIRCRAFT PROPELLER ELECTRICAL DEICER SYSTEM

Grover O. Nelson, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,519
Int. Cl. H05b 1/00
U.S. Cl. 219—201 9 Claims



A flexible, compact lead containing current-conducting wires extends within the spinner housing from the propeller assembly to a propeller blade unit which is relatively rotatable to adjust the pitch of the blade. The wires are encased in a sleeve having enlarged ends for secure clamping to the propeller assembly and to a clamping member on the propeller blade unit. The wear in this part of the system which receives the greatest stress and twisting is reduced by the lead construction and when replacement is necessary this can be done quickly without requiring replacement of the propeller deicer boot.

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3,644,704

## SNOWMOBILE TOE WARMER

Jack J. Polly, Sr., 2524 Silver Creek Drive, Franklin Park, Ill.

Filed Mar. 31, 1971, Ser. No. 129,792
Int. Cl. B60l 1/02
U.S. Cl. 219—202 2 Claims

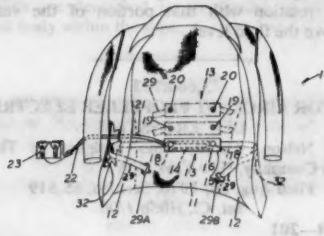
A housing is formed of sheet metal encapsulated in plastic. This housing has an inner chamber with a rearwardly facing opening to the chamber. The housing is attached to the footboards of a snowmobile. Between the metal walls is an electric heater. The opening and chamber are of a size to receive the toe portion of a person's footwear. Insulation is provided between the heating element and the adjacent exterior of the housing.

3,644,705

## LOW-VOLTAGE, ELECTRICALLY HEATED SHIRT

Richard L. Johnson, Easton, Conn., assignor to Timely Products Corporation

Filed Sept. 23, 1970, Ser. No. 74,790
Int. Cl. H05b 1/00
U.S. Cl. 219—211 10 Claims



A low-voltage electrically heated shirt adapted to operate on less than six volts. The low-voltage heater assembly for the shirt is constructed so that it can be readily detached from a shirt permitting the shirt to be optionally worn either as a heated shirt or an unheated shirt. The heater assembly may be also detachably fastened to the shirt in any of several adjusted positions. Stretchable bands are operatively connected to the heater assembly to draw the heater assembly close to the body of the wearer when worn as a heated shirt to provide for maximum transmission of heat to the body in any of the adjusted positions.

3,644,706

## METHOD FOR SUPPLYING HEATED FLUID TO A DIVER'S CLOTHING

Leroy N. Larenzo, Houston, Tex., and Mark P. Banjavich, New Orleans, La., assignors to Taylor Diving & Salvage Co., Inc., New Orleans, La.

Original application June 20, 1968, Ser. No. 738,458, now Patent No. 3,558,852. Divided and this application Nov. 10, 1970, Ser. No. 88,265
Int. Cl. H05b 3/00
U.S. Cl. 219—211 1 Claim

A method which is intended to supply heated fluid to divers' clothing of the type including a fluid inlet connection communicating with internal fluid circulation passages in the clothing. The method includes the steps of pumping fluid from a source thereof into an enclosed chamber and directing the fluid in a flow path through the chamber to an outlet communicating with the inlet to the diver's clothing. Heat is supplied to the fluid in the flow path to raise the temperature of the fluid. The temperature of the fluid in the flow path subsequent to heating is sensed and the supply of heat to the fluid is reduced whenever the sensed temperature exceeds a predetermined value.

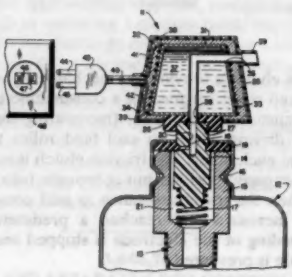
A heating unit which is intended to supply heated fluid to divers' clothing of the type provided with a fluid inlet connection communicating with internal fluid circulation passages in the clothing. The unit includes a housing having an enclosed main chamber. Pump means connected with the housing includes a pump inlet communicating with a source of the fluid and a pump outlet communicating with the main chamber for pumping the fluid therethrough. Chamber outlet means in the housing communicates with the main chamber and is adapted to be connected to the inlet connection of the diver's clothing. The pump outlet and the chamber outlet means are positioned at opposite ends of a fluid flow path through the main chamber. Heating means connected with the housing extends into the flow path for supplying heat to the fluid therein. Temperature-responsive means connected with the housing extends into the flow path at a point downstream of the heating means. The temperature-responsive means is operatively connected with the heating means to reduce the heat supplied thereby when the temperature of the fluid exceeds a predetermined value.

3,644,707

## SAFETY HEATER FOR PRESSURE DISPENSED PRODUCT

Christopher Hollet Costello, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of application Ser. No. 686,576, Nov. 29, 1967. This application Sept. 21, 1970, Ser. No. 74,112
Int. Cl. H05b 1/00; B67d 5/62
U.S. Cl. 219—302 7 Claims



An attachment for heating shaving cream or the like material being dispensed from an aerosol-type container having a depressible hollow valve stem through which the material is discharged includes a casing of heat and electrical insulation material having a base at its lower end provided with a downwardly open bore adapted to fit upon the valve stem. A flow passage having highly heat conductive walls extends from the bore to a lateral opening in the casing. A confined body of heat storage material, such as water, alcohol, powdered metal or the like, is sealed within the casing in surrounding relation to the flow passage. The body of heat storage material is heated by an electrical resistance heating element arranged within the casing in surrounding relation thereto. The heating element has such a short connection to the usual electrical wall outlet that normally the connection must be broken to enable the user to conveniently dispense heated material.

3,644,708

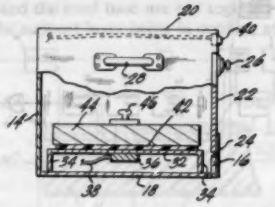
## PORTABLE HEATING OVEN FOR PREHEATING RIGID VINYL SHEETS

Dare E. Edwards, 5450 Conway Road, Chelsea, Mich.

Filed July 1, 1970, Ser. No. 51,625
Int. Cl. F27d 11/02
U.S. Cl. 219—386 1 Claim

A portable heating oven for preheating rigid vinyl sheets for on-the-job fabrication consisting of an elongated sheet metal housing, a flat heat transmitting plate disposed in a horizontal position in the housing and having depending legs

supported on the bottom wall of the housing, an electric heating element on the bottom side of the heat-transmitting plate for imparting heat thereto, and a door hingedly mounted on the front side of the housing to enable the positioning of vinyl sheets to be heated on top of the heat-transmitting plate. The heat-transmitting plate and its leg supports are of a configuration to allow for expansion of the plate and the legs when heated.



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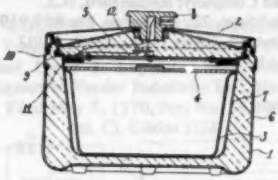
**3,644,709**
**AUTOMATIC WARMER**

**Mitsuo Hojo, 3-134, 7-chome Kamikakihana-machi, Higashisumiyoshi-ku, Osaka, Japan**

**Filed Apr. 30, 1970, Ser. No. 33,354**
**Int. Cl. F27d *11/02***
**U.S. Cl. 219—439** **1 Claim**



Warming pan comprising heating elements positioned to heat contents by radiation in addition to heating pan itself by conduction.

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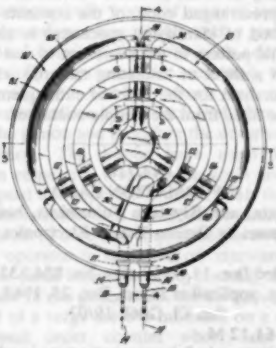
**3,644,710**
**ELECTRIC SURFACE HEATER ASSEMBLY**

**Lester D. Drugmand, and Donald M. Cunningham, both of Pittsburgh, Pa., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed June 5, 1970, Ser. No. 43,828**
**Int. Cl. H05b *3/68, 3/06***
**U.S. Cl. 219—463** **9 Claims**



A support for a surface-type electric heating element for a stove top, including an adapter ring, a drip bowl and a spider, formed as a one-piece sheet-metal stamping, the surface element being adapted for plug-in connection with a terminal block, and having connection with the spider portion of the support to resist shifting of the surface element that otherwise might be effected by the thrusting force of the plug-in operation, and also to resist separation of the surface heater from its support.

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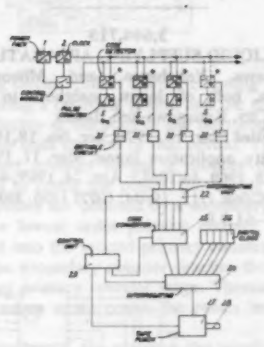
**3,644,711**
**DATA-RECORDING APPARATUS**

**Willi Haller, Aldingen, Germany, assignor to J. Hengstler K.G., Aldingen, Germany**

**Filed June 26, 1970, Ser. No. 50,142**
**Claims priority, application Germany, Oct. 18, 1969, P 19 52 659.1**
**Int. Cl. G06k *7/04, 9/16***
**U.S. Cl. 235—61.1** **31 Claims**



A clock operable to produce clock pulses and a plurality of counters are provided, also a plurality of pulse lines, each of which extends from said clock to one of said counters and is adapted to transmit clock pulses from said clock to said counter. A plurality of code carriers are provided, each of which is associated with one of said counters. The code carriers are provided with different codes. A plurality of code detectors are provided, each of which is associated with one of said code carriers and one of said counters and adapted to removably receive the associated code carrier in a control position and arranged to reject code carriers other than the associated one. At least one of said code carriers is in said control position in the associated code detector. Each of said code detectors comprises contacts included in the pulse line leading from the clock to the associated counter. Said contacts are operable to control the transmission of pulses in said lines in response to a movement of the associated code carrier to said control position.

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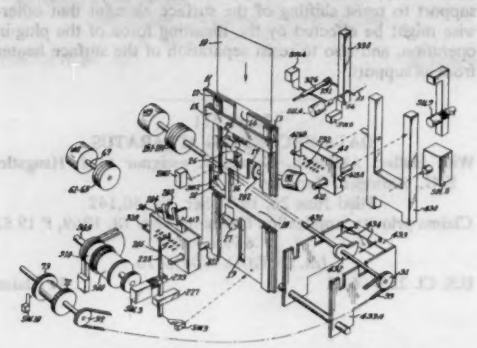
**3,644,712**
**ELAPSED TIME COMPUTER**

**Albert S. Goodrich, Jr., R. I, Boggs Hill Road, Newtown, Conn.**

**Filed Oct. 15, 1968, Ser. No. 767,618**
**Int. Cl. G06k *15/00***
**U.S. Cl. 235—61.8 R** **36 Claims**

Apparatus automatically and repetitively operative upon insertions of a card, to print the time of insertion and the

time between the insertion and the subsequent insertion; data for the necessary elapsed time computation being registered in a restricted field associated with each printline.



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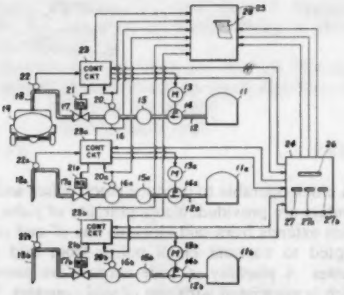
3,644,713

## LIQUID-SUPPLYING APPARATUS

Ken Hayakawa, Yokohama, and Mitsuaki Tamada, Sagamihara, both of Japan, assignors to Tokico Ltd., Kawasaki-City, Kanagawa-ken, Japan

Filed Mar. 10, 1970, Ser. No. 18,191
Claims priority, application Japan, Mar. 11, 1969, 44/18456; Mar. 18, 1969, 44/20643; Apr. 14, 1969, 44/28818
Int. Cl. G06k *1/12*, *19/04*; G07f *1/06*; H01h *43/08*
U.S. Cl. 235—61.9 R 5 Claims



A liquid-supplying apparatus having a single card reader connected to each of a plurality of liquid-supplying systems for supplying different sorts of liquid. The card reader controls the respective liquid supplying system by cooperating with a discrimination card which consists of a main card and a subcard disengageably connected in a set.

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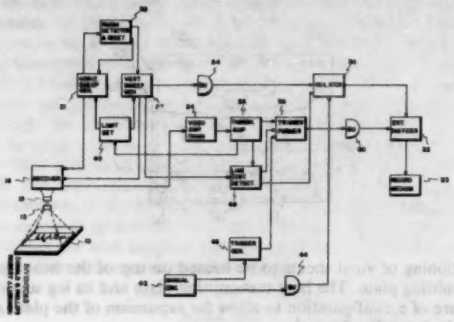
3,644,714

## SYSTEM FOR TRANSLATING DATA FROM A DISPLAY INTO ELECTRICAL SIGNALS SUITABLE FOR STORAGE

Donald G. Phillips, 904 Stokes Avenue, Collingswood, N.J., and Robert J. Lubonski, 430 W. Browning Road, Am-8, Bellmawr, N.J.

Filed May 21, 1969, Ser. No. 826,402
Int. Cl. G06k *11/00*
U.S. Cl. 235—61.11 E 4 Claims

A system for translating data from a chart into electrical signals includes means for focusing the chart on to a storage tube. The tube is electrically scanned by horizontal and vertical sweep signals. When line crossings on the chart displayed during said scanning operation are encountered output signals are produced. The output signals are compared with one of the sweep signals to obtain analog voltage signals representative of the line crossings. The analog signals may be suitably converted to digital signals for storage in a suitable storage medium.



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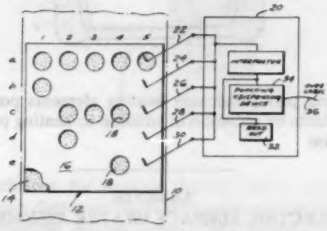
3,644,715

## MACHINE READABLE LABEL AND SAMPLE IDENTIFICATION SYSTEM UTILIZING THE SAME

William J. Holderith, Wyckoff, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Sept. 22, 1969, Ser. No. 859,919
Int. Cl. G01n *31/00*; G06k *19/02*
U.S. Cl. 235—61.11 A 2 Claims



An improved label for containers and the like is provided. The label includes an undersheet having a surface of electrically conductive material and an oversheet of insulating material adapted to overlie the undersheet. The oversheet includes a plurality of holes punched therein in a pattern indicative, in a prearranged code, of the contents of the container. A method of identifying specimens is also provided wherein the hole pattern in the oversheet of one container is reproduced on a sheet of insulating material which is then used as an oversheet for the label of subsequent containers which are to be filled from the sample container.

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3,644,716

## INFORMATION CARD

Masanori Nagata, and Kiyotaka Fukushima, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 11, 1969, Ser. No. 884,132
Claims priority, application Japan, Dec. 25, 1968, 43/113323
Int. Cl. G06k *19/02*
U.S. Cl. 235—61.12 M 6 Claims

An information card of the magnetic-type in which card information is magnetically recorded. The card comprises a base sheet made of a thermoplastic material having a desired rectangular shape and a thickness enough to give the card

required mechanical strength, and a magnetic sheet consisting of a support layer of the same thermoplastic material as the material of the card base and a magnetizable layer formed on one surface of the support layer. The magnetizable layer may be covered with a protective coating. The magnetic sheet and the card base are put together with the other surface of the support layer being in contact with one surface

of the card base. The card base and the magnetic sheet are then heated and compressed so that the contacting portions of the material of the card base and the support layer of the magnetic sheet are fused together to produce a card of unitary construction. The exposed surface of the card base may be provided with symbols printed thereon expressing necessary information, and this surface may be covered by a transparent coating for protection of the printed information.

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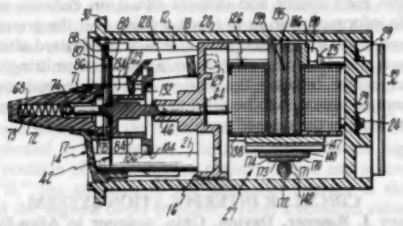
**3,644,717**

## COUNTER RESET MECHANISM

**Howard J. Voegelin, Cheshire; Ernest G. Hoffman, Middlefield, and Lloyd J. Lapointe, West Hartford, all of Conn., assignors to Veeder Industries Inc., Hartford, Conn.**

**Filed May 7, 1970, Ser. No. 35,406**
**Int. Cl. G06m 1/28**
**U.S. Cl. 235—92 C** **6 Claims**



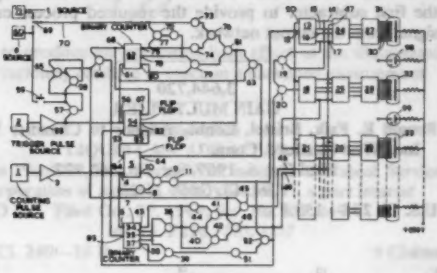
An electromagnetically operated counter comprising a pair of radially spaced number wheels and a pair of resetting knobs mounted coaxially therewith each adapted to be individually axially depressed for resetting the respective number wheel. The number wheels are interconnected through an intermediate pinion such that when each wheel is depressed, the pinion and therefore the other wheel is locked against rotation. The knobs have teeth for positively clutching the respective wheel to the knob and a stationary tooth is adapted to cooperate with the knob teeth for ensuring the wheel is located in a full count position when the knob is released. A core and clapper subassembly of an electromagnetic operator is mounted on rearwardly extending posts of a two-piece frame for being pivotally adjusted about the axis of one of the posts to set the air gap of the clapper. A star wheel of a verge drive is mounted on a shaft supporting the lowest order counter wheel, and a verge is reciprocably mounted on the free end of the clapper for reciprocable movement along an axis transverse to the axis of the star wheel shaft and has a slot receiving the star wheel shaft for orienting the verge with respect to the star wheel.

**3,644,718**

## PULSE-COUNTING ARRANGEMENTS

**Colin Terry Osborne, and Michael Keith Burdett, both of Bradford, Yorkshire, England, assignors to The English Electric Company Limited, London, England**

**Filed May 20, 1969, Ser. No. 826,250**
**Claims priority, application Great Britain, May 20, 1968, 23,888/68**
**Int. Cl. H03k 21/18**
**U.S. Cl. 235—92 EA** **7 Claims**



In a counting circuit, pulses from a counting pulse source are counted during a counting period and the count is transferred into a display at the start of the next counting period where it remains until the end of that period. The circuit includes a primary counter having a number of successive stages arranged to count the pulses, but during the transfer operation the pulses are counted by a secondary counter instead of by the lowest order primary counter stage and a carry is entered into the second primary counter stage when the count in the secondary counter reaches the capacity of the lowest order primary counter stage. Thereafter the primary counter stages again count the pulses in the normal manner.

In one application of the counter, the number of pulses generated during a counting period gives a measure of the diameter of a workpiece, and the display provides a direct indication of the diameter. The start of each counting period is determined by a trigger pulse generated by rotation of the workpiece.

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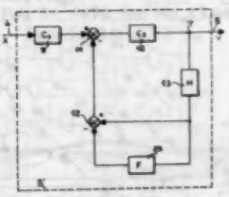
**3,644,719**

## TIME DELAY COMPENSATION IN A CLOSED-LOOP PROCESS CONTROL SYSTEM

**Roland Rouxel, Seyssinet, and Gabriel Chevalier, Grenoble, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques, Paris, France**

**Filed Mar. 3, 1970, Ser. No. 16,212**
**Claims priority, application France, Mar. 3, 1969, 6905752**
**Int. Cl. G05f 11/01**
**U.S. Cl. 235—150.1** **11 Claims**



The deleterious effect of time lag in an industrial process on the operation of a closed-loop feedback control system in which such process is regulated may be substantially eliminated without sacrificing static accuracy of the system

by a specially designed process controller. The controller includes an input and an output network connected in tandem in the main path of the feedback loop through one input of a first subtracter. The controller output is coupled to one input of a second subtracter through an additional network whose transfer function is equal to the product of the input network transfer function and the equivalent unretarded transfer function of the controlled process. The output of the additional network is also coupled to the other input of the second subtracter through a retardation circuit having the same delay characteristics as that of the process. The output of the second subtracter is connected to the second input of the first subtracter to provide the required process control signal from the output network.

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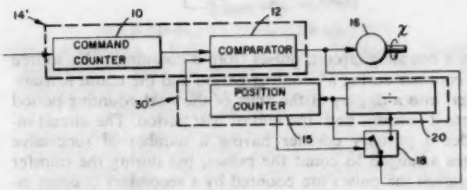
**3,644,720**
**GAIN MULTIPLIER**

**Ronald E. Falk, Bristol, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.**

**Filed Oct. 6, 1969, Ser. No. 863,977**
**Int. Cl. G05b *11/26***
**U.S. Cl. 235—150.1** **6 Claims**




Circuitry for digitally implementing gain variation as a function of input signal magnitude. Gain variation, in stepwise fashion, in either a feedback or forward loop is achieved by varying the weight given signals applied to a counter. In the feed forward embodiment, the output of the counter comprises the circuit output signal while in the feedback loop embodiment the output of the counter is compared with a stored count commensurate with the circuit input signal.

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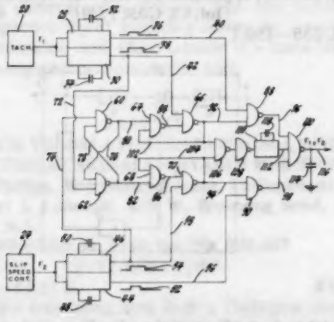
**3,644,721**
**APPARATUS AND METHOD FOR DIGITAL FREQUENCY ADDITION AND SUBTRACTION**

**Mark E. Preiser, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 9, 1970, Ser. No. 88,064**
**Int. Cl. G06f *15/20*; H03b *3/04***
**U.S. Cl. 235—150.3** **4 Claims**




The digital frequency system of this invention provides an output signal comprised of pulses which have a frequency equal to the sum or difference of the frequencies of two input signals. Each of the input signals is used to generate a first pulse train for summation or subtraction at the output of the system and a second pulse train for controlling the counting of the pulses of the first pulse train to ensure against error due to pulse overlap. If there is a possibility of error due to pulse overlap, one of the pulses to be counted is inhibited while the other is passed to the output. Each inhibited pulse is replaced by an auxiliary pulse which is then processed in the same manner as the original pulses.

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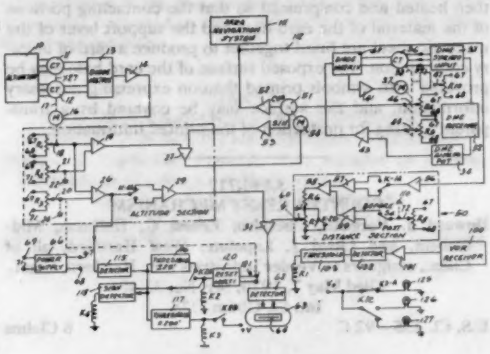
**3,644,722**
**VERTICAL CONTROL SYSTEM**

**James Hobbs, and John B. Carocari, both of Overland Park, Kans., assignors to Butler National Corporation, Oak Brook, Ill.**

**Filed Aug. 18, 1969, Ser. No. 850,770**
**Int. Cl. G06g *7/78***
**U.S. Cl. 235—150.23** **10 Claims**




A vertical control system which allows pilots of aircraft to control their ascent and descent based on distance and altitude information so as to reach a point over the ground at a desired altitude. The set point at which the desired altitude is to be reached may be offset from a radio transmitting station either before or after the station and the desired angle of descent or ascent may be set into the system so as to control the aircraft in the desired profile.

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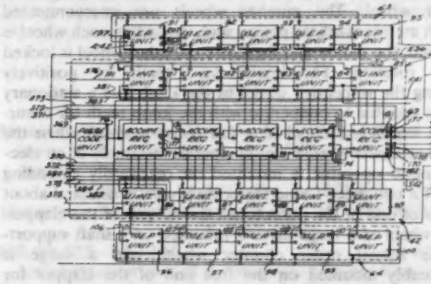
**3,644,723**
**CIRCULAR INTERPOLATION SYSTEM**

**Harvey J. Rosener, Dayton, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.**

**Original application Feb. 3, 1964, Ser. No. 341,958, now Patent No. 3,506,812. Divided and this application Aug. 5, 1969, Ser. No. 854,013**
**Int. Cl. G06f *7/38, 15/34*; G06j *1/20***
**U.S. Cl. 235—156** **10 Claims**



An operational integrator comprising an integrand register and an accumulator register, a pulse code unit for supplying

four series of pulses and a carry pulse to transfer the numbers stored in respective integrand decades to respective associated accumulator decades in parallel, with provision for carry between successive accumulator decades in response to the carry pulse. The number in the integrand register can be selectively changed in a positive or negative direction to provide for circular interpolation, for example.

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3,644,724

## CODED DECIMAL MULTIPLICATION BY SUCCESSIVE ADDITIONS

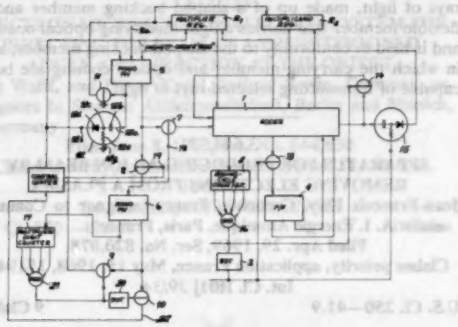
**Stefan Hristov Angelov, and Snejanka Vladimirova Hristova, both of Sofia, Bulgaria, assignors to Zentralen Institut po Istchislitelna Technika, Sofia, Bulgaria**

**Continuation-in-part of application Ser. No. 672,501, Oct. 3, 1967, now abandoned. This application Mar. 27, 1970, Ser. No. 23,405**

Claims priority, application Bulgaria, Oct. 4, 1969, I-1174

Int. Cl. G06f *7/52*

U.S. Cl. 235—159 10 Claims



A circuit and system for performing multiplication operations in a desk-top calculator having two registers designed to receive the multiplier and the multiplicand; the multiplier register has a number of order positions corresponding to the multiplication capacity or maximum product while the multiplicand register has a number of orders corresponding to at least one more than the maximum number of orders of the multiplicand to be handled. The value stored in the highest order position of the multiplier register is read and as long as it is "0," the contents of the multiplier register is shifted toward the highest order position. When a nonzero value arrives at the highest order position of the multiplier register, a "9" is formed in the highest order position of the multiplicand register and the contents of the multiplier and multiplicand registers are added, the result being stored in the multiplier register. The highest order positions of both registers are similarly summed and the tens value of the highest order addition is dropped, thereby diminishing the number in the highest order position of the multiplier register by "1" with each addition. The cycle is repeated until the entire multiplier has been reduced to zero. The product is found in the lower order portion of the multiplier register.

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3,644,725

## LIGHT DISPLAY APPARATUS

**Robert L. Lochridge, Jr., 460 California Avenue, Palo Alto, Calif.**

**Filed Sept. 11, 1969, Ser. No. 857,008**

Int. Cl. F21l *11/00*

U.S. Cl. 240—1 3 Claims

Light display apparatus including a plurality of flexible elongated members joined at one end to a handle means and having at their other ends means for creating brilliant spots of light so that by imparting motion to the handle means the light spots are caused to move more or less randomly in space as the elongated members flex. Such apparatus may be

used to produce an interesting light effect as the illuminated ends variously oscillate in space in a darkened environment.

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3,644,726

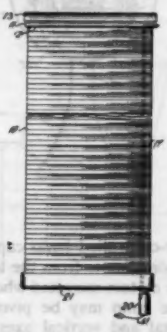
## LIQUID CASCADE APPARATUS

**Anton Pfeuffer, New York, N.Y., assignor to Patent Service Corporation of America, New York, N.Y., a part interest**

**Filed Oct. 29, 1969, Ser. No. 872,249**

Int. Cl. F21p *7/00, 1/02*

U.S. Cl. 240—10 R 9 Claims



A liquid cascade apparatus for use as an interior decoration consisting of a flat or circular corrugated surface which may be constructed from plastic panels or cylinders in which a supply of liquid such as water is evenly disposed from the top of the corrugated member and permitted to travel across its corrugated surface while the surface is illuminated with natural or artificial light. The movement of the liquid across the corrugated surface provides an ornamental decoration and produces pleasant and relaxing sounds.

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3,644,727

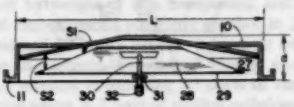
## AIR HANDLING LIGHTING FIXTURE

**Robert E. Garrett, and Leon D. Dame, both of 1544 West 8th Street, Los Angeles, Calif.**

**Filed Feb. 24, 1970, Ser. No. 13,645**

Int. Cl. F24f *13/18*

U.S. Cl. 240—47 7 Claims



An encased lighting fixture structure incorporates fluorescent light tubes and also defines air passage means on opposite sides having first ends terminating in opposite side openings and their other ends opening out in elongated bot-

tom slots adjacent to the opposite sides and substantially coextensive therewith. Each of the air passage means includes an elongated damper member of tapered configuration to define with the passage an air passage of increasing cross-sectional area towards the end of the member so that air passing through is distributed from the slot with a substantially uniform air velocity profile. The physical dimensioning of the casing structure, air passage means, and damper members is such as to provide sufficient air volume flow with a minimum height dimension.

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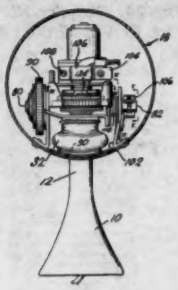
3,644,728

## MOTOR-CONTROLLED LAMP

Lawrence E. Hessemer; Richard P. Manning; Harry G. Sparks, and Walter H. Powers, all of Jackson, Mich., assignors to Sparcraft, Inc., Jackson, Mich.

Filed Aug. 11, 1969, Ser. No. 848,895
Int. Cl. B60q *1/06*
U.S. Cl. 240—61.9 10 Claims



An electric motor-controlled lamp capable of being controlled from a location remote from the lamp utilizing a pair of reversible electric motors mounted wholly within the lamp housing wherein the lamp may be pivoted by the motors about both horizontal and vertical axes by energizing the electric motors. The lamp includes flood and spotlight filaments, the spotlight filament switch including resistor means connected in series with the electric drive motors to automatically reduce the rate of lamp adjustment when the spotlight filament is utilized.

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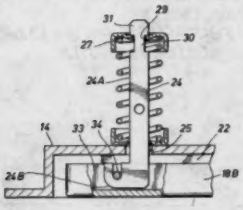
3,644,729

## CLOSURE FOR A LIGHT FIXTURE OR THE LIKE

Ralph M. McFarlin, Pasadena, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed June 15, 1970, Ser. No. 45,957
Int. Cl. F21v *17/00*
U.S. Cl. 240—73 BC 11 Claims



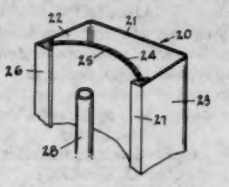
A closure for a light fixture or the like comprising a wall having an access opening therethrough and a window connected to the wall for swinging between a closed position in which it is over the opening and an open position to one side of the opening to provide access to the interior of the fixture.

3,644,730

## SELECTIVE REFLECTORS

James C. Ogle, Jr., Toledo, Ohio; Dwight W. Barkley, New Kensington, Pa., and Arthur I. Bodkins, Winthrop, Mass., assignors to Libbey-Owens-Ford Glass Company, Toledo, Ohio

Filed Aug. 29, 1967, Ser. No. 664,111
Int. Cl. F21v *7/12, 7/22, 29/00*
U.S. Cl. 240—103 1 Claim



A selective reflector, for a source of visible and invisible rays of light, made up of a shaped backing member and a flexible member that carries a light modifying optical coating and is held in conformity to the shaped backing member; and in which the carrying member and optical coating are both capable of transmitting selected rays of light.

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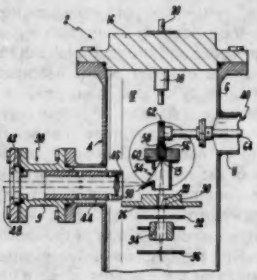
3,644,731

## APPARATUS FOR PRODUCING AN ION BEAM BY REMOVING ELECTRONS FROM A PLASMA

Jean-Francois Eloy, Grenoble, France, assignor to Commissariat A. L'Energie Atomique, Paris, France

Filed Apr. 29, 1969, Ser. No. 820,078
Claims priority, application France, May 15, 1968, 151943
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 9 Claims



The present invention relates to a method of production of ions wherein a plasma is generated from a target and then subjected to a number of successive electric fields to sort the particles which form the plasma by providing the successive electric fields with increasing amplitudes to slow down the electrons, collecting said electrons on electrodes and then causing the ion-enriched beam to converge towards the exit aperture by means of a final electric field.

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3,644,732

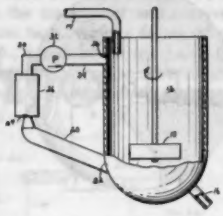
## CRYSTALLIZERS

Reuel Shinnar, 110 Ash Drive, Great Neck Estates, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,205
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 D 16 Claims

The invention relates to improvements in crystallizers and more particularly, to the elutriation of the mix in a crystal-

lization vessel, and measurement of the particle size distribution in the elutriated sample to obtain a control signal for



controlling the parameters associated with the crystallization process.

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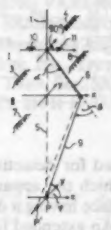
3,644,733

## ELECTRON MICROSCOPE DEFLECTION SYSTEM FOR DIRECTING THE BEAM AT A PREDETERMINED ANGLE AND DIRECTION AT THE OBJECT

Otto Wolff, and Dieter Krahl, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 8, 1967, Ser. No. 644,650
Claims priority, application Germany, June 10, 1966, S 104241
Int. Cl. H01j *37/26*; G01n *23/22*
U.S. Cl. 250—49.5 A 1 Claim



A particle beam device such as an electron microscope has a predetermined optical axis and means for directing a particle beam at a predetermined angle to an object. The beam-directing means has a first pair of electrical deflecting coils situated at a first plane for deflecting the beam away from the optical axis toward a second plane, the first and second planes each being normal to the optical axis and the second plane being disposed intermediate the first plane and the object. A second pair of electrical deflecting coils are situated at the second plane for deflecting the beam in a direction opposite to the direction of deflection provided by the first pair of deflecting coils so as to direct the beam to the object at the predetermined angle. The first and second deflecting coil pairs deflect the beam in a third plane which is perpendicular to the first and second planes and which contains the optical axis. An additional pair of electrical deflecting coils are situated at least at one of the first and second planes. An electrical supply is connected to the additional pair of coils for supplying the latter with an excitation proportional to the excitation of the first and second pairs of deflecting coils thereby enabling the additional deflecting pair of coils to compensate for undesired deflections of the beam out of the third plane caused by the first and second pairs of deflecting coils.

3,644,734

## THIN LAYER CHROMATOGRAPHIC ANALYSIS UTILIZING MIXTURES OF FLUORESCENT SUBSTANCES AND ULTRAVIOLET RADIATION

Masao Inoue, Kawasaki, and Zenzo Tamura, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Original application Aug. 28, 1968, Ser. No. 755,984. Divided and this application Mar. 6, 1970, Ser. No. 17,155
Int. Cl. G01n *21/22*
U.S. Cl. 250—71 R 8 Claims

A method of qualitative analysis of sampled materials by thin layer chromatography or paper chromatography using an adsorbent mingled with a mixture of two or more kinds of fluorescent substances, which exhibit different excitation and emission spectra from each other, and applying an ultraviolet radiation to said adsorbent.

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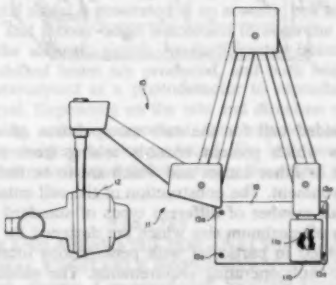
3,644,735

## LEVELING MECHANISM FOR X-RAY MACHINES

Cornelius Keith Vanderveiden, Kansas City, Mo., assignor to Litton Medical Products, Inc., Des Plaines, Ill.

Filed Dec. 31, 1969, Ser. No. 889,492
Int. Cl. H05g *1/00*
U.S. Cl. 250—91 2 Claims



A leveling mechanism comprising two eccentrics rotatably mounted around the mounting shaft of a suspension system that supports an X-ray head. Respective wrenches for such eccentrics are mounted to the suspension system and may cooperatively engage their respective eccentrics to facilitate leveling of the suspension system in order to prevent drifting of the X-ray head.

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3,644,736

## BACK-SCATTERING ABSORBER MATERIALS FOR GAMMA-RAYS

Masao Kato; Goro Tanaka, and Seigoro Yamamoto, all of Tokyo, Japan, assignors to Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1968, Ser. No. 773,419
Int. Cl. G21f *1/08*
U.S. Cl. 250—108 R 5 Claims

Back-scattering absorber materials for γ-rays comprising a mixture consisting of 70 to 90 percent by weight of lead compound, 10 to 20 percent by weight of barium compound and 3 to 10 percent by weight of iron compound, and a vehicle. In one type of embodiment, polyvinyl alcohol in 25 percent aqueous solution of 28 to 39 percent by weight of said mixture is used as the vehicle. In another type of embodiment, the vehicle is a mixture comprising 30 parts of vinyl acetate as a film-forming agent, 0.2 part of methyl cellulose dissolved in 10 parts of water as a thickening agent, and 4 parts of ammonium salt of vinyl acetate copolymers in 25 percent solution as a dispersing and wetting agent, and said vehicle mixture being 25 to 67 percent by weight of the first principal mixture. Regardless of the type of vehicle, the back-scatter-

ing absorption characteristics of the absorber materials are substantially invariant, so far as the composition of the first said principal mixture is kept constant.

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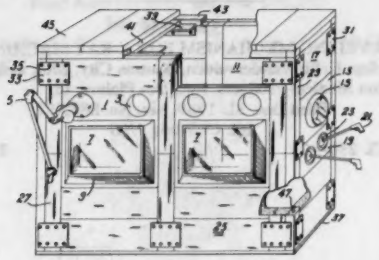
**3,644,737**

## DEMOUNTABLE CELLS FOR SHIELDING RADIOACTIVE ELEMENTS

**Letto Fedi, 29 Avenue de Petit Parc, L'Etang-la-Ville, and Charles Glachet, Rue Jean Mermoz-Batiment S., Taverny, both of France**

**Filed Dec. 27, 1968, Ser. No. 787,323**
**Claims priority, application France, Dec. 28, 1967, 134171**
**Int. Cl. G21f 7/02, 7/06**
**U.S. Cl. 250—108 WS** **10 Claims**



A shielded cell for the safe manipulation of objects or materials which present hazards arising from radioactive radiation or other causes and which are to be isolated from the environment. The construction of the cell entails the use of a small number of different types of standard reversible elements of maximum size which are designed for reuse and are provided in particular with penetrations located in accordance with operating requirements. The elements to be interassembled by known means for ensuring compliance with shielding requirements are essentially endowed with shapes related to a square unit of which one side is a suitable multiple of the common thickness of said elements, to rectangular elements each having a length corresponding to one side of said square unit of a width corresponding to simple submultiples thereof, a cornerpost provided with means for assembly and fastening at right angles, and rectangular elements adapted to carry overlap slabs for covering said cells.

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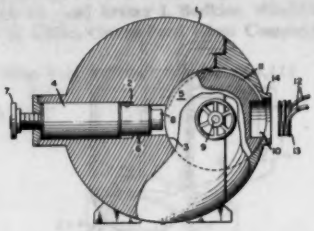
**3,644,738**

## DEVICE AFFORDING TOTAL BIOLOGICAL PROTECTION FOR IRRADIATION OF A FLUID CIRCULATING WITHIN A TUBE

**Jose Bost, 2 Rue Marcel Porte, 38-Grenoble; Daniel Hollard, 37 Route de Chartreux, 38-La Tronche; Michel Peccoud, Rue des Martyrs, 38-Claix, and Michel Suscillon, 35 Avenue Jean Jaures, 38-Grenoble, all of France**

**Filed Mar. 25, 1969, Ser. No. 810,157**
**Claims priority, application France, Apr. 5, 1968, 147251**
**Int. Cl. G21f 3/00**
**U.S. Cl. 250—108 R** **1 Claim**

A device affording total biological protection for the irradiation of a fluid circulating within a tube, said device being characterized in that it comprises a lead body having two communicating cavities and two lead elements, one element being adapted to carry a radioactive source at one end thereof and being accurately and removably fitted within one of said cavities in order to permit of sliding displacement therein, the second element being accurately fitted within the other cavity in order to permit of pivotal displacement therein and provided with a peripheral recess for accommodating a ring on which is wound a portion of the fluid circulation tube and with curved grooves having a caliber which corresponds to that of said fluid circulation tube and terminating in said peripheral recess.



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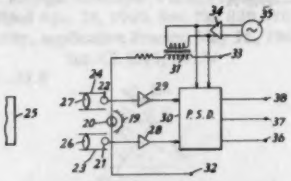
**3,644,739**

## APPARATUS FOR DETECTING POSITIONAL ERRORS UTILIZING HIGH-FREQUENCY MODULATION OF LIGHT SOURCE AND PHASE-SENSITIVE DETECTOR

**Alan Wilkinson, Egham; Stewart Charles Hine, Harrow, and David Robert Bosher, Hayes, all of England, assignors to Electric & Musical Industries Limited, Middlesex, England**

**Filed Nov. 28, 1969, Ser. No. 880,615**
**Claims priority, application Great Britain, Sept. 9, 1969, 44,390/69**
**Int. Cl. G01n 21/30; G02f 1/28; H01j 39/12**
**U.S. Cl. 250—209** **3 Claims**



Apparatus is disclosed for detecting error in the positioning of a member to which the apparatus is attached in relation to a reference surface having a different reflectivity from the surrounding area. An extended light source modulated at a frequency high relative to mains frequency is adapted to produce dispersive illumination for floodlighting the reference surface and at least two photoelectrically sensitive devices are arranged for viewing substantially only light reflected from respective discrete areas on the reference surface spaced in one direction and for producing in cooperation with the reference surface output electrical signals representative of the illumination received by the devices. Means are provided for deriving a position error signal depending on the differences between the output signals.

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**3,644,740**

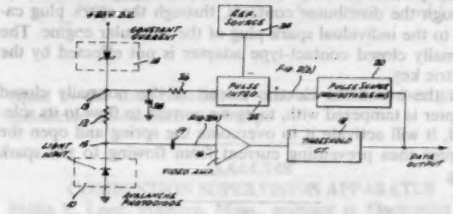
## CONTROL CIRCUIT FOR BIASING A PHOTODETECTOR SO AS TO MAINTAIN A SELECTED FALSE ALARM RATE

**Burton E. Dobratz, Manhattan Beach, and Robert P. Farnsworth, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed July 22, 1969, Ser. No. 846,300**
**Int. Cl. G01c 3/08; H01j 39/12; H03k 3/42**
**U.S. Cl. 250—211 J** **14 Claims**

A circuit for controlling the bias supplied to an avalanche photodetector so as to maintain a "false alarm" rate within acceptable limits, while maximizing the photodetector sensitivity for those limits. The circuit is particularly useful in

conjunction with laser-ranging (distance-measuring) equipment in which a timing interval is normally initiated coincident with the transmission of a light pulse and terminated coincident with the receipt of the reflected light pulse. The timed interval is, of course, indicative of the distance of the reflector from the transmitter and receiver. If the detector sensitivity is too high, various forms of noise can produce false alarms, i.e., signals indistinguishable from that attributable to the reflected light pulse. The subject circuit controls the bias on the photodetector to maintain a constant false



alarm rate, e.g., 1 percent, during the timing intervals of interest, while permitting the detector sensitivity to be maximized for that rate. The circuit utilizes a pulse shaper which continually responds to input signal excursions exceeding a certain threshold level to control an integrator. If such excursions occur at a rate greater than the desired false alarm rate, the integrator will modify the detector bias to lower its sensitivity. On the other hand, if such excursions occur at a rate lower than the desired rate, the bias is modified to increase the detector sensitivity.

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**3,644,741**

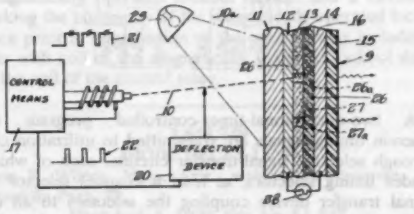
**DISPLAY SCREEN USING VARIABLE RESISTANCE MEMORY SEMICONDUCTOR**

**Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed May 16, 1969, Ser. No. 825,289**

**Int. Cl. H01l *17/00***

**U.S. Cl. 250—213 R** **18 Claims**



An electrically operated display screen including a support surface on which active layers, preferably of electroluminescent phosphor having a nonlinear voltage-brightness characteristic and variable resistance memory semiconductor materials, are deposited one adjacent the other with transparent conductive layers disposed on either side thereof to provide electrode surfaces for connection to an alternating current voltage source which substantially excites the electroluminescent layer to generate relatively high-intensity visible light in those areas thereof where the variable resistance memory semiconductor material is in the low-resistance condition. The layer of memory semiconductor material has discrete portions which are individually alterable between stable high- and low-resistance conditions by application of predetermined amounts of energy to form the desired visible light patterns on the display screen.

**3,644,742**

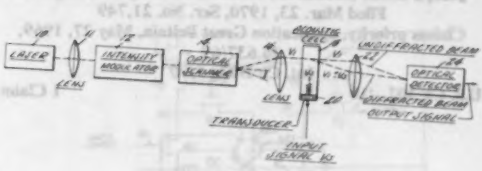
**LASER-ACOUSTIC PROCESSOR FOR ACCOMPLISHING TIME REVERSAL OF AN ELECTRIC SIGNAL**

**Michael J. Brienza, Vernon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Original application Oct. 4, 1967, Ser. No. 672,924, now Patent No. 3,539,245. Divided and this application Aug. 6, 1970, Ser. No. 61,793**

**Int. Cl. G02f *1/28*; H01j *3/14*; H04b *9/00***

**U.S. Cl. 250—216** **6 Claims**



An acoustic signal is generated in an acoustic cell such as a quartz bar, and a laser beam is scanned through the cell intersecting the acoustic signal. An undiffracted beam and a frequency shifted beam are produced, and both beams are optically heterodyned at a photodetector to reproduce the acoustic signal. Depending on the rate and direction of laser beam scanning, a time compressed, time expanded or time inverted output signal may be produced. The laser beam may also be intensity modulated to further vary the output signal.

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**3,644,743**

**METHOD AND APPARATUS FOR ANALYSING LOW-THERMAL EXCITABLE DISPERSIVE SYSTEMS**

**Bedrich Binek, Prague, Czechoslovakia; Sieglinde Przyborowski, and Werner Ullmann, both of Berlin, Germany assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia**

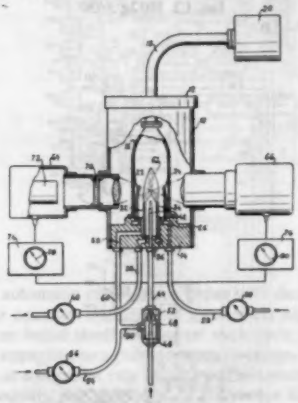
**Continuation of Ser. No. 592,604, Nov. 7, 1966**

**Filed Oct. 22, 1969, Ser. No. 868,503**

**Claims priority, application Czechoslovakia, Nov. 6, 1965, 6629/65**

**Int. Cl. G01n *21/26***

**U.S. Cl. 250—218** **8 Claims**



An analyzer for aerosols has a transparent heating chamber in which a mixture of the aerosol to be analyzed

and of a dilutent is heated to the emission temperature of the dispersee particles in the aerosol, the dilution being sufficient to produce sequential light pulses from the emitting particles. The pulses of a desired wavelength are transmitted through a filter to a photomultiplier whose output pulses are analyzed in a known manner to obtain data on concentration, size distribution and composition of the dispersed particles.

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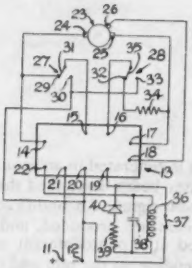
**3,644,744**
**WINDSCREEN WIPING SYSTEMS FOR ROAD VEHICLES**

**William David Holt, Colne, Lancashire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Mar. 23, 1970, Ser. No. 21,749**
**Claims priority, application Great Britain, May 27, 1969, 26,637/69**
**Int. Cl. H02g *3/00***
**U.S. Cl. 307—10** **1 Claim**



A windshield wiping system has a wiper motor and a control switch for the motor, the control switch having an on position and an off position in serving when moved to its off position to reverse the flow of current to the wiper motor to cause the wiper motor to move the wipers clear of the windshield at which point a limit switch is tripped to stop the motor. In such a system, means is provided for effecting a delay between wipes so that the system operates more satisfactorily in light rain, and in addition a further limit switch is incorporated to ensure that the wipers park on the windshield when they are operating with the delay.

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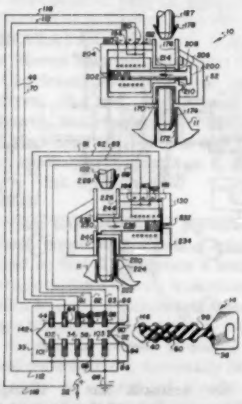
**3,644,745**
**ELECTRICAL LOCK FOR IGNITION SYSTEMS**

**George Bell, 30-21 Edwin Avenue, Fort Lee, N.J.**

**Filed Nov. 10, 1969, Ser. No. 875,334**
**Int. Cl. H02g *3/00***
**U.S. Cl. 307—10** **7 Claims**



An electrical lock for vehicular ignition systems having adapters that are irremovably interposed between a predetermined number of spark plug cable receptacles and their distributor contacts. The adapters being of two types, a normally open contact type and a normally closed contact type, the normally open contact-type adapter having a spring-loaded solenoid which is activated by an electric key closing an electric circuit to direct current to the solenoid to overcome the spring and close the adapter permitting current to flow from the ignition system battery through the distributor contacts through the spark plug cable to the individual spark plug of the vehicular engine for its operation. The normally closed contact-type adapter has a spring-loaded solenoid which permits electric current to flow from the battery, through the distributor contacts, through the spark plug cable, to the individual spark plug of the vehicular engine. The normally closed contact-type adapter is not effected by the electric key.

In the event the electric circuit of the normally closed adapter is tampered with, to cause current to flow to its solenoid, it will activate it to overcome the spring and open the adapter thus preventing current from flowing to the spark plug.

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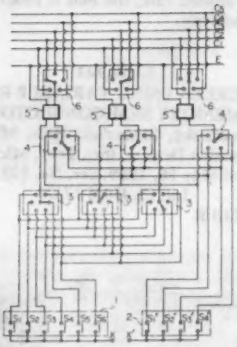
**3,644,746**
**CIRCUIT-CONTROLLED PROGRAM SWITCH HAVING SELECTIVE SIGNAL-TRANSFER CIRCUITS**

**Shunsei Kratomi, 456 Maegawa, Tachibana-machi, Japan**

**Filed July 7, 1970, Ser. No. 52,969**
**Claims priority, application Japan, July 29, 1969, 44/59375**
**Int. Cl. H02j *3/00***
**U.S. Cl. 307—41** **15 Claims**



A two-dimensional-timer-controlled program switch wherein timing signals are transmitted to utilization circuits through selective signal-transfer circuits, each of which includes timing selectors, at least a channel selector and a signal transfer device coupling the selectors to an output utilization means. The signal transfer device, which has its input terminals and output terminals electrically isolated from each other but also provides a signal transfer path therebetween, couples timing signals generated by a pair of cyclically operable switches which preferably take the form of stepping switches, to an output utilization device in accordance with the settings of the various selectors of the selective signal-transfer circuits.

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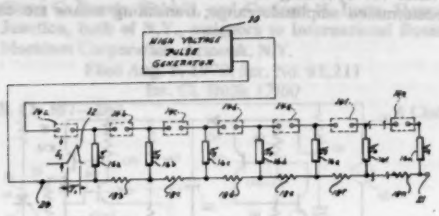
**3,644,747**
**SPARK GAP NANOSECOND PULSE GENERATOR**

**Bobby R. Gray, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Aug. 7, 1970, Ser. No. 61,889**
**Int. Cl. H03k *5/04***
**U.S. Cl. 307—106** **2 Claims**

An apparatus for generating a short duration higher peak voltage pulse from a basic lower pulse voltage of longer duration. A series of spark gaps are arranged such that the total

voltage from the basic long duration pulse is applied to each gap in succession. A delay line with a fixed delay which is




equal to the total breakdown time of all the other gaps is connected across each spark gap.

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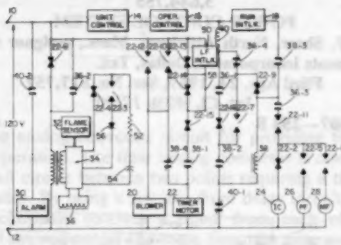
**3,644,748**
**COMBUSTION SUPERVISION APPARATUS**
**Philip E. Lord, Woburn, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.**
**Filed Aug. 3, 1970, Ser. No. 60,229**
**Int. Cl. H01h** *35/00*
**U.S. Cl. 307—117** **14 Claims**



Combustion supervision apparatus includes a flame relay responsive to a flame detector for providing an indication of flame in the supervised combustion chamber, a control relay, a magnetically operated lockout device, and a circuit for checking the continuity of the magnetically operated lockout device prior to energization of the control relay including in series with coil of the magnetically operated lockout device and the coil of the control relay.

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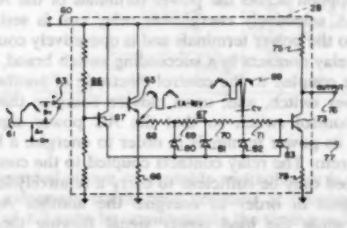
**3,644,749**
**DIODE DELAY LINE**
**Milton E. Wilcox, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**
**Filed Aug. 5, 1970, Ser. No. 61,337**
**Int. Cl. H03k** *17/28*
**U.S. Cl. 307—208** **6 Claims**



A delay line adapted for fabrication in integrated circuit form and suitable for use in a television receiver or the like is in the form of an RC circuit in which the capacitors are zener diodes, slightly reverse-biased with respect to desired input signals applied to the delay line.

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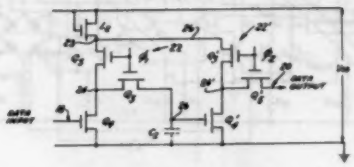
**3,644,750**
**TWO-PHASE LOGIC CIRCUIT**
**David Campbell, Glenrothes, Scotland, assignor to General Instrument Microelectronics Ltd., Glenrothes, Scotland**
**Filed Sept. 9, 1970, Ser. No. 70,764**
**Claims priority, application Great Britain, June 17, 1970, 29,469/70**
**Int. Cl. H03k** *17/60*
**U.S. Cl. 307—208** **8 Claims**



A two-phase logic circuit comprises a double inverter having a series of insulated gate field-effect transistors for conditionally charging or discharging the operative node capacitances. The load FET is in series with a low-impedance switching FET which is clocked to provide a charging path during the operative clock intervals.

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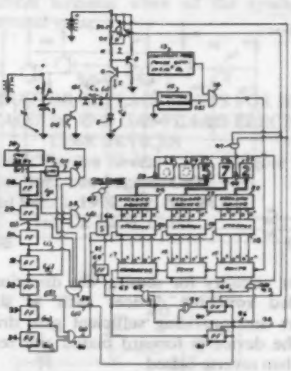
**3,644,751**
**DIGITAL CAPACITANCE METER**
**William L. Spaid, RR I, South River Road, Cedarville, Ohio**
**Original application Oct. 28, 1968, Ser. No. 771,026. Divided and this application July 10, 1970, Ser. No. 53,728**
**Int. Cl. H03k** *4/08*
**U.S. Cl. 307—228** **1 Claim**

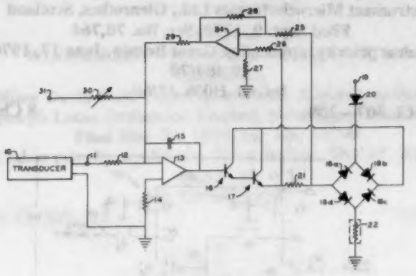


A fully automatic capacitance meter with decimal readout. The meter operates cyclically at a relatively high frequency, acting in an initial small fraction of each cycle to charge the unknown capacitor to a predetermined voltage, discharge the capacitor at a constant rate to zero voltage, measure the time interval required for discharge to produce a time analog of the capacitance, and convert the time analog to a decimal number. The remaining large fraction of each cycle is used to display the decimal number. Automatic range switching is accomplished by changing the discharge rate.

## 3,644,752
## ANALOG OUTPUT CIRCUIT

Vernon R. Clark, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 8, 1971, Ser. No. 104,985
Int. Cl. H03k 17/00
U.S. Cl. 307—229 4 Claims

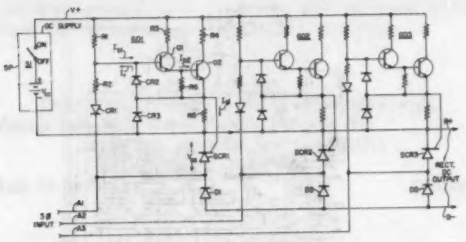



A circuit to establish an output current proportional to an input signal comprises an input summing amplifier, having the output signal therefrom applied to a current amplifier. A resistor and a bridge rectifier assembly are connected in the output circuit of the current amplifier. A differential feedback amplifier applies an amplified signal, representative of the potential drop across the resistor, to the input of the summing amplifier.

## 3,644,753
## BIAS SENSING GATE DRIVER CIRCUITRY

Howard S. Ginsberg, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 22, 1970, Ser. No. 48,056
Int. Cl. H03k 17/00
U.S. Cl. 307—252 Q 2 Claims



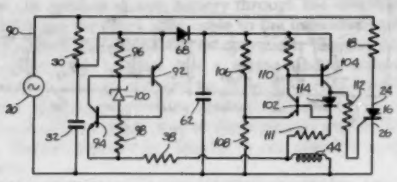
Driver circuitry for sensing the direction of bias across controlled switching devices such as silicon controlled rectifiers and providing sufficient gate drive therethrough when the device is forward biased and removing the gate drive when reverse biased.

## 3,644,754
## CIRCUIT FOR THE CONTACTLESS CONTROL OF THYRISTORS

Peter Dosch, Rankstrasse 15, and Emil Benz, Larchenstrasse 10, both of Canton of St. Gall, Switzerland

Filed Sept. 18, 1968, Ser. No. 760,528
Claims priority, application Switzerland, Sept. 27, 1967, 13136/67
Int. Cl. H01h 36/00; H03k 17/70, 17/72
U.S. Cl. 307—252 N 13 Claims

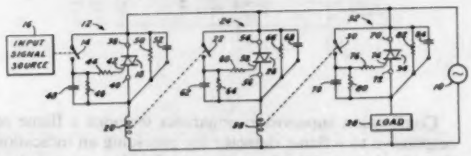
Circuit for contactless control of thyristor is response to approachment of predetermined electromagnetic field influencing means; input means are provided for supplying input pulses to said circuit and control means are coupled to thyristor for operating same in response to input pulse in predetermined amplitude range; translating means are coupled to the input means and control means for applying the input pulses to control means, the translating means includes circuit electromagnetic means operable in response to approachment of said influencing means to establish said input pulse in said predetermined amplitude range.



## 3,644,755
## POWER CONTROL SYSTEM

Richard F. Shaw, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 21, 1969, Ser. No. 817,757
Int. Cl. H03k 17/00
U.S. Cl. 307—252 B 6 Claims



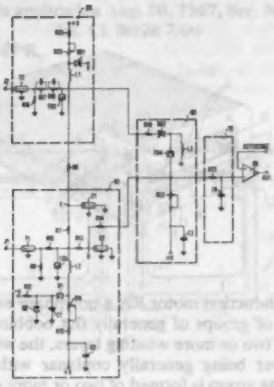

A relatively low power level electrical signal is utilized for controlling the switching action of a plurality of relay networks in a power control system so as to control the AC power being supplied to a load. A plurality of switch branches are provided each including an AC power switch having a pair of power terminals and a control electrode arranged to carry a relatively high power level signal through its power terminals. Energization of the power switch is effected by the application of a relatively low power level signal to its control electrode through a switch such as a pair of relay contacts which need have only a relatively low power-handling capacity in comparison with the power level to be supplied across the power terminals of the AC power switch. A selectively energizable relay coil is serially connected to the power terminals and is operatively coupled to a pair of relay contacts in a succeeding switch brand, which in turn, are coupled to the control electrode of another similar AC power switch, and, upon closure energize this another power control switch so that the AC power signal flows through its power terminals in order to energize a load coupled thereto. The relay contacts coupled to the control electrode need only be sufficient to carry a relatively low power level signal in order to energize the another AC power switch, while the load power signal flowing through the power terminals may be at least an order of magnitude greater than that supplied to the control electrode for rendering the another power switch conductive.

3,644,756

## TIME ANALOG CONVERTER CIRCUIT FOR JITTER-FREE OPERATION

Philippe C. Furois, Fishkill, and Garland H. Latta, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,211
Int. Cl. H03k 17/00
U.S. Cl. 307—269 6 Claims



A time analog converter circuit for providing time stable circuit operation. The time analog converter is connected to an overall circuit between two points requiring a time stable relationship. By using a suitable fixed delay circuit, the time analog converter receives a signal from each of the two points at approximately the same time, the time analog converter determines the difference in the time of occurrence of the two signals and provides a corresponding correcting signal.

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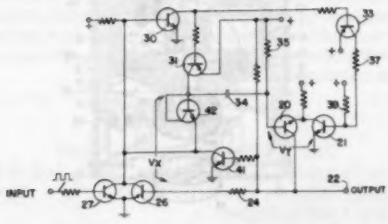
3,644,757

## VOLTAGE AND TEMPERATURE STABILIZED MULTIVIBRATOR CIRCUIT

John R. Rezek, Addison, Ill., and Thomas M. Yackish, Hammond, Ind., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 17, 1969, Ser. No. 858,830
Int. Cl. H03k 3/284
U.S. Cl. 307—273 16 Claims



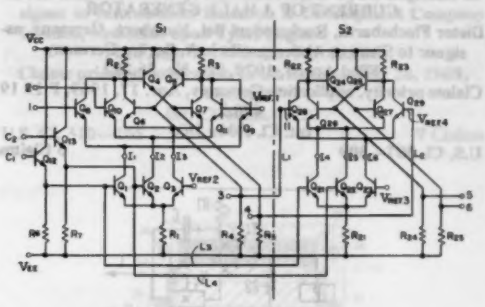
An integrated circuit monostable multivibrator is provided with an extremely stable time constant at nominal supply voltages of 1.2 volts by commutating the timing capacitor of the multivibrator between boundary conditions which vary together to compensate for variations in supply voltage and temperature.

3,644,758

## FLIP-FLOP CIRCUIT

Shigeki Matsue, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed July 11, 1969, Ser. No. 841,064
Claims priority, application Japan, July 15, 1968, 43/50128
Int. Cl. H03k 3/12
U.S. Cl. 307—291 1 Claim



A flip-flop circuit having a plurality of input signal terminals and a plurality of current terminals corresponding to the input signal terminals on a one-to-one basis (corresponding on a "one-to-one basis" is defined in this application to mean they are equal in number and the relationship being described exists between the [n]th terminal of one and the [n]th terminal of the other; the [n−1]th the terminal of one and the [n−1]th terminal of the other; and so on), and a further current terminal. The output is responsive to the input signal applied to the input signal terminal corresponding to that one of the current terminals having current flow; the output being the same as that generated just previously when the current flow is to said further current terminal. A plurality of synchronizing signal terminals corresponding to the plurality of current terminals supplies a current to an associated one of the plurality of current terminals during the time when the synchronizing signal at that synchronizing signal terminal is at a first value, and supplying a current to said further current terminal when all the synchronizing signals are at a second value.

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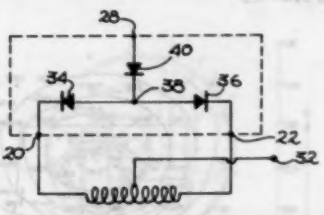
3,644,759

## SEMICONDUCTOR REPLACEMENTS FOR HOT CATHODE VACUUM AND GAS-FILLED ELECTRON TUBE DEVICES

Frederick E. Hanby, Garden Grove, Calif., assignor to Electronic Resources, Inc., Los Angeles, Calif.

Filed Dec. 2, 1970, Ser. No. 94,411
Int. Cl. H03k 17/00
U.S. Cl. 307—305 9 Claims



Semiconductor replacements for hot cathode vacuum and gas-filled electron tube devices such as diodes and thyratrons wherein an appropriate semiconductor device is coupled through a diode to each terminal of the terminal pair representing the heated cathode connections of the electron tube device. For electron tube diode replacements, the coupling device is one or more high-voltage semiconductor diodes. A resistor may be placed in parallel with each of the

diodes connected to the cathode terminals so as to provide a leakage path for the reverse bias leakage current of the high-voltage diode. For thyratron replacement, the coupling device is a silicon-controlled rectifier, coupled to the grid terminal through a suitable coupling means.

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**3,644,760**

**SWITCHING CIRCUIT FOR PULSING THE CONTROL-CURRENT OF A HALL GENERATOR**

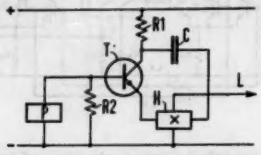
**Dieter Flachsbarth, Ruckersdorf Bei, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Apr. 7, 1970, Ser. No. 26,222**

**Claims priority, application Germany, Apr. 17, 1969, P 19 19 440.2**

**Int. Cl. H01r *5/00***

**U.S. Cl. 307—309** **5 Claims**




A switching circuit for pulsing the control-current of a Hall generator has a switching component with two current electrodes and a control electrode as well as a Hall generator with two control-current electrodes and two voltage electrodes. One of the control-current electrodes is connected to one of the current electrodes of the switching component. A capacitor is connected between the other of the control-current electrodes and the other of the current electrodes of said switching components, whereby the capacitor discharges through the Hall generator via the two control-current electrodes and through the switching means via the two current electrodes when the switching means is turned on. A resistor has two terminals and one of the terminals is connected to the other of the current electrodes of the switching component. One of the voltage electrodes of the Hall generator and the other of the terminals of the resistor are adapted for connection to an energy source, whereby the capacitor is charged through the resistor and the impedance of the Hall generator between the other control-current electrode and the one voltage electrode.

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**3,644,761**

**$LiTaO_3$ PIEZOELECTRIC VIBRATORS**

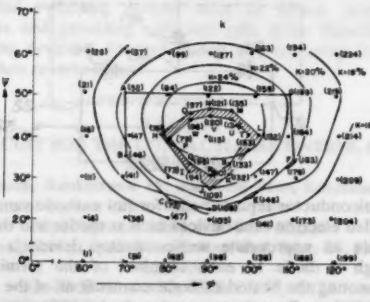
**Kikuo Doi; Masao Takahashi; Satoshi Nanamatsu, and Yoshio Fujino, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan**

**Filed Sept. 2, 1970, Ser. No. 68,915**

**Claims priority, application Japan, Sept. 3, 1969, 44/70201**

**Int. Cl. H01v *7/02***

**U.S. Cl. 310—9.5** **8 Claims**



Piezoelectric lithium tantalate ($LiTaO_3$) single-crystal vibrator plates employ a range of crystal orientations which coincidentally give rise to good piezoelectric activity and a temperature stable resonant frequency.

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**3,644,762**

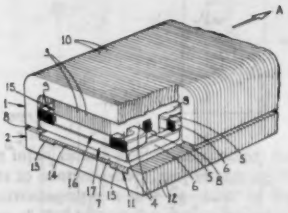
**LINEAR INDUCTION MOTOR STATOR**

**John Frederick Eastham, Long Ditton, England, assignor to Tracked Hovercraft Limited, London, England**

**Filed Feb. 22, 1971, Ser. No. 117,461**

**Int. Cl. H02k *41/04***

**U.S. Cl. 310—13** **21 Claims**



A linear induction motor has a polyphase energizing winding formed of groups of generally flat bobbin-type windings arranged in two or more winding layers, the windings in each winding layer being generally coplanar with one another. Each winding group is formed of two or more of the windings one within the other. In each group the innermost winding encompasses one or more teeth of the primary member magnetic material, the next winding encompasses that tooth together with at least one of the adjacent teeth, and so on.

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**3,644,763**

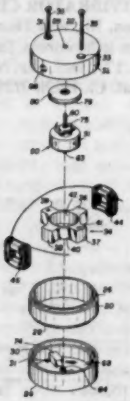
**LIMITED ANGLE DC TORQUE MOTOR**

**Alfred Skrobisch, Huntington, N.Y., assignor to Allard Instrument Corporation, Westbury, N.Y.**

**Filed Dec. 8, 1970, Ser. No. 96,134**

**Int. Cl. H02k *33/02***

**U.S. Cl. 310—36** **10 Claims**



A torque motor has a stator including a ringlike magnetic casing containing four circumferentially spaced radial magnetic poles. The casing is closed by a base and cover. Wire coils connected in series are wound on two poles or on all four poles. Thin magnetic webs connect the poles and define

a ring in which rotates a permanent magnet rotor. The magnetic ring constitutes a magnetic bridge which permits the rotor to float freely when the coils are deenergized. A spring or auxiliary magnetic means is provided to return the rotor to a predetermined angular position.

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**3,644,764**

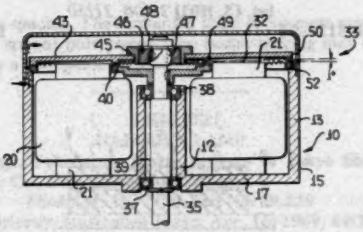
**HARMONIC DRIVE FOR DIGITAL STEP MOTOR**

Harold R. Newell, Bradford, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.

Continuation-in-part of application Ser. No. 627,410, Mar. 31, 1967. This application Aug. 30, 1967, Ser. No. 664,331

Int. Cl. H02k 7/06

U.S. Cl. 310—49 R 12 Claims



A digital step motor having a wobble plate which rotates about a shaft, to produce mating contact between two sets of associated gear teeth, under the influence of a stepping electromagnetic drive. The wobble plate is coupled to the shaft about which it rotates by a universal joint free to move axially but restrained radially of the shaft.

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**3,644,765**

**COMMUTATORLESS DIRECT CURRENT MOTOR**

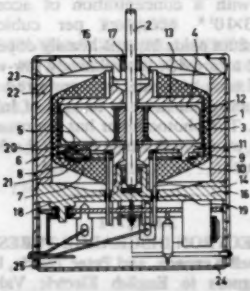
Jan Janson, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1970, Ser. No. 21,412

Claims priority, application Netherlands, Mar. 25, 1969, 6904617

Int. Cl. H02k 11/00

U.S. Cl. 310—68 3 Claims



Commutatorless direct current motor preferably for use in apparatus for the reproduction of music and having a magnetic rotor enclosed by stationary coils. Magnetic field sensitive electronic circuit elements to control the supply of electric current to the stationary coils are located near an axial boundary surface of the rotor between the rotor and diametrically projecting parts of the coils. A magnetic conducting plate supports the magnetic field sensitive element so as to concentrate the field.

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**3,644,766**

**SYNCHRONOUS ALTERNATING CURRENT ELECTRICAL MACHINES**

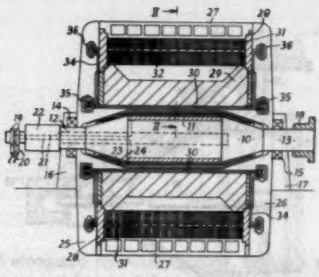
Austin Hughes, Fossway, Newcastle upon Tyne, England, assignor to International Research & Development Company Limited, Newcastle upon Tyne, England

Filed Aug. 7, 1970, Ser. No. 61,898

Claims priority, application Great Britain, Aug. 20, 1969, 41,630/69

Int. Cl. H02k 19/26

U.S. Cl. 310—165 7 Claims



A synchronous AC generator has a DC excited superconducting field winding on the rotor and a nonsuperconducting armature winding on the stator. The armature winding is composed of active conductors and of reactance conductors connected in series with the active conductors and disposed in a magnetic shield surrounding the active conductors whereby the magnetic shield required to prevent large fields outside the machine due to the superconducting field winding also serves to provide the reactance necessary in the reactance conductors to limit short circuit currents.

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**3,644,767**

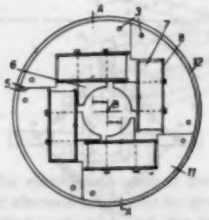
**SEGMENTED STATOR**

Sadanand Vithal Kasargod, and Shreeniwas Shankar Abhyankar, both of c/o Electronics Corporation of India Ltd., Hyderabad, India

Filed Mar. 23, 1970, Ser. No. 21,862

Int. Cl. H02k 1/12

U.S. Cl. 310—254 7 Claims



In the segmented stator assembly disclosed, four teeth extend inwardly, and rectangularly relative to each other, from surrounding segments. The teeth form a bore at the center of

the assembled segments. Each tooth has two parallel edges one of which extends along a line passing through the center of the bore. The centerline of each tooth is offset from the bore center. Coil-carrying bobbins are mounted on respective teeth so their axes coincide with the centerlines of the teeth on which they are mounted. The offset of each bobbin leaves space for intrusion of an edge of the transversely directed adjacent bobbin.

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**3,644,768**

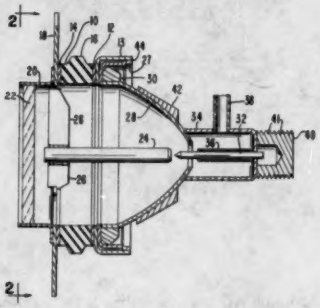
**HOUSING FOR A SEALED BEAM ARC LAMP**

**Russell C. McRae, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.**

**Continuation-in-part of application Ser. No. 740,345, June 26, 1968, now abandoned. This application July 13, 1970, Ser. No. 54,180**

**Int. Cl. H01j** *61/30, 61/52*

**U.S. Cl. 313—44** **7 Claims**



Improved housing for a sealed beam arc lamp comprising an arcuate reflector having radial symmetry with respect to a beam axis, an optical window disposed substantially normal to the axis, a mounting ring having a truncated right-circular conical exterior surface disposed coaxially to the axis, and externally accessible helical screw threads disposed coaxially to the axis.

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**3,644,769**

**COOLING ARRANGEMENTS FOR VALVES**

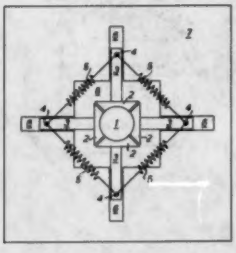
**Matthew Campbell Kennedy, Chelmsford, England, assignor to English Electric Valve Company Limited, London, England**

**Filed Sept. 10, 1970, Ser. No. 71,136**

**Claims priority, application Great Britain, Sept. 12, 1969, 45,047/69**

**Int. Cl. H01j** *25/00*

**U.S. Cl. 313—46** **4 Claims**



An arrangement for cooling the collector of a travelling wave tube includes a heat sink which is connected via good thermally conductive collets to the collector. The collet comprises a collet jaw, which is in close contact with the collector, and an adjustable collet shoe which is slidably situated between the collet jaw and the heat sink. The arrangement allows lateral and angular displacement of the collector relative to the heat sink without degradation of the heat transfer properties.

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**3,644,770**

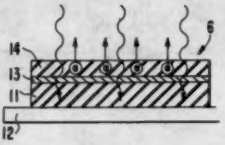
**PHOTOEMITTER HAVING A P-TYPE SEMICONDUCTIVE SUBSTRATE OVERLAID WITH CESIUM AND N-TYPE CESIUM OXIDE LAYERS**

**Ronald L. Bell, Woodside, Calif., assignor to Varian Associates, Palo Alto, Calif.**

**Continuation-in-part of application Ser. No. 660,722, Aug. 15, 1967, now abandoned. This application Jan. 18, 1968, Ser. No. 698,941**

**Int. Cl. H01j** *39/06, 31/50*

**U.S. Cl. 313—94** **14 Claims**



A junction-type photoemitter is disclosed. The photoemitter includes a heavily doped P-type semiconductive substrate for absorbing photons of radiation to be converted into electrons to be emitted. An alkali metal layer such as cesium metal is formed over the substrate member for filling the surface energy states of the P-semiconductive substrate. Finally, a layer of cesium oxide is formed over the alkali metal layer to provide a low-work function surface facing the vacuum into which the electrons are emitted from the photoemitter. The substrate member may be made of a III–V compound semiconductor or an alloy of two different III–V compound semiconductors (each compound semiconductor including one element from the third group of Periodic Table and another element of the fifth group of the Periodic Table) to provide a semiconductive band-gap energy which is equal to or slightly more than the work function of the cesium oxide layer. The P-type semiconductive substrate member is heavily doped with a concentration of acceptor dopant greater than $3\times10^{18}$ acceptors per cubic centimeter. Likewise, the cesium oxide layer is heavily doped with donor atoms of cesium to provide the relatively low-work function characteristic of such material. In a preferred embodiment, the P-semiconductive substrate is formed of InP or an alloy of InP and InAs. The photoemitter has improved conversion efficiency in the wavelength range from 0.5 microns to 1.37 microns wavelength.

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**3,644,771**

**ELECTRON DISCHARGE TUBES**

**Matthew Campbell Kennedy, and Peter Tourle, both of Essex, England, assignors to English Electric Valve Company Limited, London, England**

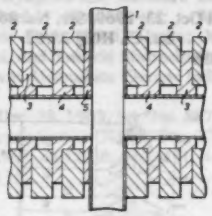
**Filed Sept. 10, 1970, Ser. No. 71,135**

**Int. Cl. H01f** *7/00;* **H01j** *3/04*

**U.S. Cl. 313—153** **7 Claims**

An electron discharge tube, for example a travelling wave tube, which employs a periodic magnetic field, is provided with at least one pair of adjacent magnets with larger spacing in the axial direction than is employed between the magnets of other adjacent pairs. The perturbation of the field due to

the larger spacing is reduced by providing only one pole piece interposed between the two magnets on each side of



the larger spacing. The remaining pairs of magnets may have normally spaced pole pieces. The larger spacing may be occupied by a waveguide connection.

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3,644,772

## HALOGEN LAMP

Yooji Yuge, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 16, 1970, Ser. No. 29,229
Claims priority, application Japan, Apr. 16, 1969, 44/29248
Int. Cl. H01k *1/50*
U.S. Cl. 313—174 1 Claim

A lamp having a bulb in which a halide substance and a nitrogen or inert gas are sealed. The halide substance to be sealed is in the form of chloroform which amounts to 0.01 to 0.10 micromol per cubic centimeter of the volume of the bulb.

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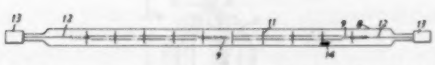
3,644,773

## A HYDROGEN-HALOGEN, FILAMENT LAMP WITH A HYDROGEN GETTER FLAG

James Richard Coaton, and John Michael Rees, both of London, England, assignors to Thorn Lighting Limited, London, England

Filed Apr. 24, 1970, Ser. No. 31,480
Int. Cl. H01k *1/50, 1/56*
U.S. Cl. 313—174 3 Claims



Alkyl iodides and other hydrogen and halogen containing compounds are employed in the fill of tungsten-halogen cycle electric incandescent lamps, means being provided in the lamp envelope for combining with hydrogen to reduce the hydrogen content of the reactive system of the fill whereby recombination of the hydrogen and halogen can be minimized, thus providing a maximum content of halogen in the fill for supporting the regenerative tungsten-halogen cycle. Where an alkyl iodide constitutes the hydrogen and halogen containing component of the fill the hydrogen-combining means may be dispensed with.

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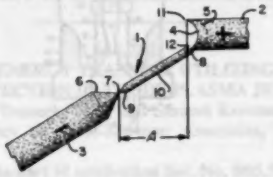
3,644,774

## IGNITOR FOR AUTOMATICALLY STARTING ARC LAMPS

Floyd Melvin Hunsaker, Amherst, N.H., and Allan Joseph Quiring, Middleburg Heights, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,677
Int. Cl. H05b *31/30*
U.S. Cl. 313—198 13 Claims



A solid elongated refractory ignitor, having a pointed projection on one end and a bifurcated slot at the opposite end, is positioned between, and in contact with, electrode rods of an arc lamp to improve arc striking therebetween. The ejectable ignitor provides an initial short circuit between the electrodes so that during application of a power supply between the electrodes, an arc will be automatically struck therebetween without the need for manual manipulation of either or both electrodes by an operator.

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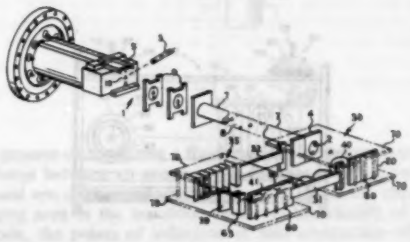
3,644,775

## ELECTRICAL INTERFERENCE REDUCER FOR GATING APPARATUS OF AN ELECTRON MULTIPLIER

Donald C. Damoth, Rochester, N.Y., and William H. Shriner, Blanchester, Ohio, assignors to The Bendix Corporation

Filed Nov. 7, 1969, Ser. No. 874,838
Int. Cl. H01j *1/00*
U.S. Cl. 313—237 3 Claims



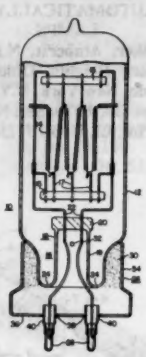
An apparatus for eliminating noise at the oscilloscope output of a magnetic electron multiplier by arranging the output anodes of the gating section so that the oscilloscope output anode is located on a different axis than the other output anodes and is protected from electromagnetic interference by a shield located between the oscilloscope anode and the other output anodes. The oscilloscope anode is preferably cup-shaped to prevent the escape of electrons impinging the anode.

3,644,776

## BROMINE FILLED BIPOST LAMP WITH A HIGH-TEMPERATURE RESISTANT GLASS ENVELOPE

Aristide R. DeCaro, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 74,991
Int. Cl. H01k 1/42
U.S. Cl. 313—318 8 Claims



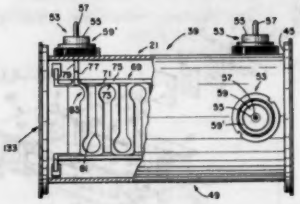
A relatively low-cost, high-maintenance incandescible bipost lamp is described. The lamp has a vitreous, high-temperature-resistant glass envelope, an operative atmosphere containing bromine, with the bipost base secured to a flared mount structure which comprises a portion of the envelope of the lamp. The filament is tungsten, and the metallic support elements within the envelope are also made of tungsten.

3,644,777

## CATHODE-RAY TUBE WITH SERPENTINE-SHAPED TRANSMISSION LINE DEFLECTION MEANS

James B. Thomas, Needham, and Vincent J. George, Winchester, both of Mass., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 2, 1970, Ser. No. 42,631
Int. Cl. H01j 23/16, 29/46, 29/70
U.S. Cl. 315—3 5 Claims



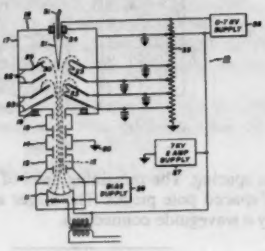
Improved high-frequency response, cathode-ray tube for tracking, determining, and recording high frequency, unknown input signals. To this end, the invention provides a sectionalized, round and square cross section CRT having ceramic, vacuumtight lead-ins; impedance matched, insulated, serpentine traveling wave deflection structures; and an electron gun incorporating an anode aperture formed with a protrusion for providing high-electron beam density.

3,644,778

## REFLEX DEPRESSED COLLECTOR

Theodore G. Mihran, Schenectady, and Wendell Neugebauer, Ballston Spa, both of N.Y., assignors to General Electric Company

Filed Oct. 23, 1969, Ser. No. 868,724
Int. Cl. H01j 23/02
U.S. Cl. 315—5.38 14 Claims



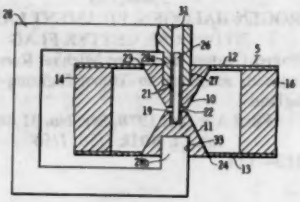
A reflex depressed collector is disclosed which facilitates electron collection on plural electron collecting surfaces in row form without adverse effects of electron reflection or back streaming. An electron beam passes by the collectors and then is radially dispersed by an electrostatic field so that electrons are given curving trajectories wherein they are first slowed to an essentially zero forward velocity and then slightly reaccelerated in a different direction before being collected on surfaces of the electrodes exposed to the beam after the beam passes thereby. The electrodes operate at a voltage lower than that which originally accelerated the stream, therefore the waste heat delivered to the collector is reduced and the power conversion efficiency of the device to which the collector is attached is increased.

3,644,779

## CAPILLARY STAGE FOR MICROWAVE TR DEVICES USING STATIC MAGNETIC FIELDS

Harry Goldie, Randallstown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,601
Int. Cl. H01j 7/46, 19/80
U.S. Cl. 315—39 6 Claims



Gaseous discharge TR switch in which two truncated cone electrodes extend inwardly from the broad sidewalls of a waveguide with the truncated ends in juxtaposition to form a discharge gap, the electrodes having a central bore with a capillary tube extending across the gap and including an ionizable gas and a magnetic field being disposed with its flux lines extending parallel to the axis of the tube and to the electric vectors of the microwave in the waveguide.

**3,644,780**

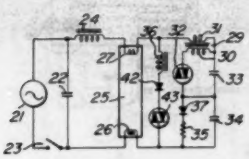
## STARTING DEVICE FOR DISCHARGE LAMP INCLUDING SEMICONDUCTORS PREHEATING AND STARTING CIRCUITS

**Shigeo Koyama, Neyagawa-shi; Motohiro Ohtsuki, Nara-shi; Kenji Shimatani, Hirakata-shi; Masao Yasuda, Higashiosaka-shi; Toru Takei, Osaka; Yasutaka Kawai, Higashiosaka-shi, and Takeshi Matsushima, Nara-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 22, 1969, Ser. No. 887,053**

Claims priority, application Japan, Dec. 27, 1968, 44/742; Feb. 6, 1969, 44/11130; 44/11131; 44/11135

**U.S. Cl. 315—100 U** **10 Claims**



A discharge lamp starter device which comprises a serial circuit constituted by a reverse blocking diode thyristor or a bilateral diode thyristor and a diode, the breakdown voltage $V_{BO}$ of the thyristor being lower than the rated source voltage but higher than the terminal voltage of a fluorescent discharge tube while the blocking voltage $V_R$ of the thyristor having a sufficiently great value with respect to the breakdown voltage $V_{BO}$, and a pulse generator circuit constituted by a pulse transformer, a capacitor and a bilateral diode thyristor, the two circuits being connected in parallel with the fluorescent discharge tube to thereby instantaneously start the fluorescent discharge tube.

**3,644,781**

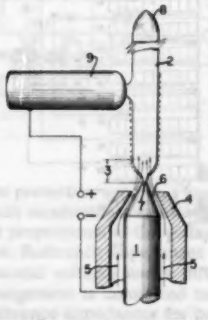
## METHOD OF ENERGY TRANSFER TO A HETEROGENEOUS FLUID MEDIUM UTILIZING A FLUID CONVECTION PLASMA JET

**Charles Sheer, Teaneck, N.J., and Samuel Korman, Hewlett, N.Y., assignors to Sheer-Korman Associates, Inc., New York, N.Y.**

**Continuation-in-part of application Ser. No. 805,574, Mar. 10, 1969, now abandoned. This application Jan. 8, 1970, Ser. No. 1,390**

**Int. Cl. H05b** *31/26;* **H05b** *1/00*

**U.S. Cl. 315—111** **6 Claims**



A process for energizing a fluid medium containing an entrained condensed phase by means of an arc discharge between an anode and a cathode having a conical tip, said arc discharge forming a contraction of the current-carrying area in the transition region in the vicinity of said cathode, the points of inflection of said contraction of the current-carrying area forming, when extended, an angle $\alpha$, which comprises forcefully projecting a fluid medium along said conical tip of said cathode into and through said contraction of the current-carrying area in the transition region in the vicinity of said cathode at a mass flow density at substantially constant convection rate which is at least sufficient to effect a rise in the temperature of said arc column at a constant current level and below a total fluid medium convection rate at substantially constant mass flow density which is sufficient to reduce the angle $\alpha$ below 40° at a constant current level, and adding a finely dispersed nongaseous medium capable of causing an enlargement in the angle $\alpha$, to said fluid medium forcefully projected along said conical tip at a total fluid medium convection rate at substantially constant total mass flow density which is below that sufficient to reduce said enlarged angle $\alpha$ below 40° at a constant current level.

**3,644,782**

## METHOD OF ENERGY TRANSFER UTILIZING A FLUID CONVECTION CATHODE PLASMA JET

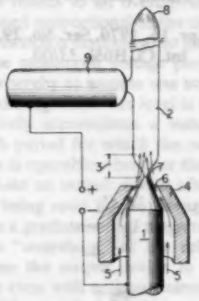
**Charles Sheer, Teaneck, N.J., and Samuel Korman, Hewlett, N.Y., assignors to Sheet-Korman Associates, Inc., New York, N.Y.**

**Continuation-in-part of application Ser. No. 805,574, Mar. 10, 1969, now abandoned. This application Jan. 8, 1970, Ser. No. 1,388**

Claims priority, application Canada, Dec. 24, 1969, 70,859

**Int. Cl. H01j** *7/24;* **H05b** *31/26*

**U.S. Cl. 315—111** **13 Claims**

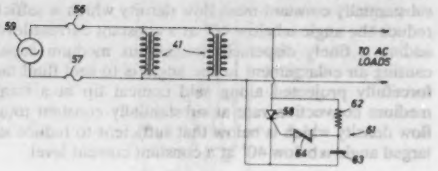


A process of energizing a fluid medium by means of an arc discharge between an anode and a cathode having a conical tip, said arc discharge forming a contraction of the current-carrying area in the transition region in the vicinity of said cathode, the points of inflection of said contraction of the current-carrying area forming, when extended, an angle $\alpha$, which comprises forcefully projecting a fluid medium along said conical tip of said cathode into and through said contraction of the current-carrying area in the transition region in the vicinity of said cathode at a mass flow density at substantially constant convection rate which is at least sufficient to effect a rise in the temperature of said arc column at a constant current level, and below a total fluid medium convection rate at substantially constant mass flow density which is sufficient to reduce the angle $\alpha$ below 40° at a constant current level.

## 3,644,783
## DC DETECTION CIRCUIT

Carl R. Snyder, Allef, Tex., assignor to Esquire, Inc.

Filed Aug. 18, 1969, Ser. No. 850,833
Int. Cl. H02h 3/20
U.S. Cl. 315—127 4 Claims




A DC detection circuit in an AC power circuit for detecting DC and for protecting AC loads from the deleterious application of a DC current. The DC detection circuit is particularly applicable to an emergency lighting system having both AC and DC power sources and AC and DC lighting facilities for detecting the application of DC and for disconnecting the AC lighting facilities to prevent their damage and for lighting the DC lighting facilities.

## 3,644,784
## SOLID-STATE INDICATOR DISPLAYS

Marcus P. Dickey, Minneapolis, and Donald C. McIntyre, Roseville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

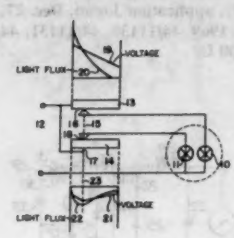
Filed Apr. 16, 1970, Ser. No. 29,093
Int. Cl. H05b 33/00
U.S. Cl. 315—169 5 Claims

A display having blocks of display contrasting elements and individual elements electrically connected in a matrix such that two input signals to the matrix energize a number of elements in the form of a pointer which moves in accordance with the input signals.

## 3,644,785
## ILLUMINATION ARRANGEMENT FOR RECORDING AND/OR REPRODUCTION IN COLOR

Sven O. Jarmar, Huddinge, Sweden, assignor to Sveriges Radio Aktiebolag, Stockholm, Sweden

Filed Oct. 3, 1969, Ser. No. 863,553
Claims priority, application Sweden, Oct. 9, 1968, 13595/68
Int. Cl. H05b 41/39
U.S. Cl. 315—298 18 Claims

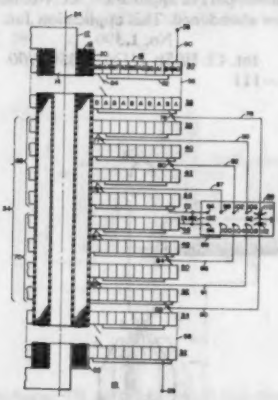



An illumination arrangement for use in connection with picture recording or reproduction in color. The device automatically compensates for changes in the spectral composition of the light at various light intensities. In one embodiment, the device includes a first lamp and a second, smaller, lamp, the lamps being coupled such that a change in the color temperature in one direction of a first lamp is compensated for by a change in the color temperature of a second lamp, the change in the color temperature of the second lamp being such in its direction and amount, to compensate for the change in color temperature of the first lamp.

## 3,644,786
## ELECTRICAL WINDINGS

Dean A. Yannucci, Niles, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1970, Ser. No. 67,179
Int. Cl. H02h 7/04
U.S. Cl. 317—15 3 Claims



An electrical winding structure having first and second tapped winding portions, and a switching device which selects and interconnects taps on the two winding portions. A capacitor is electrically connected between the two winding

portions at the coil break, i.e., between the ends of the two winding sections which are "floating" when the switching device is not in the maximum turn position, to reduce the magnitude of surge stresses across the coil break.

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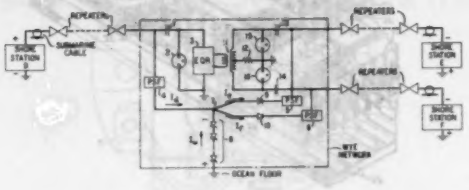
**3,644,787**

## UNDERSEA WYE CONNECTION FOR A SUBMARINE CABLE SYSTEM

**Billy Harold Hamilton, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 14, 1970, Ser. No. 97,814**
**Int. Cl. H02h** *3/24*
**U.S. Cl. 317—16** **5 Claims**



A simple and reliable diode and avalanche diode network for use at the undersea branch point of a submarine cable system having a main section and two branch sections which permit powering of the repeaters in all three sections under normal conditions. In the event of a trouble condition in a branch, power is continuously and automatically supplied to the main section and the remaining branch.

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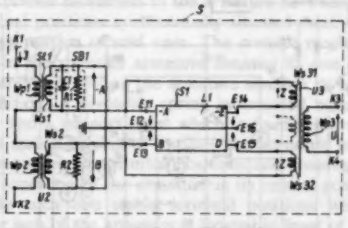
**3,644,788**

## REMOTE PROTECTION APPARATUS HAVING A POLYGONAL TRIPPING REGION

**Eckart Maenicke, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Sept. 11, 1970, Ser. No. 71,589**
**Claims priority, application Germany, Sept. 12, 1969, P 19 47 037.2**
**Int. Cl. H02h** *3/26*
**U.S. Cl. 317—27 R** **16 Claims**



A remote protection apparatus has a polygonal tripping region for fault monitoring a measuring voltage and a measuring current proportional to the voltage and current of a high-voltage line. Reference impedances provide respective auxiliary sequential voltages and a difference voltage forming circuit arrangement is connected to the measuring voltage and the reference impedances for providing difference voltages corresponding to the respective differences of the auxiliary voltages and the measuring voltage. The logic circuit is connected to the auxiliary voltages and the difference voltages and furnishes a tripping signal within a period of time, when, in a given time interval, the difference voltages have zero passages and a given sign, the time interval being equal to the time difference between respective zero passages of the auxiliary voltages.

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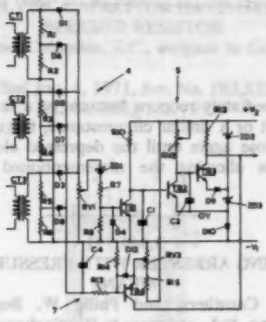
**3,644,789**

## OVERCURRENT RELAYS

**Michael Charles Stephen Simpson, Stafford, England, assignor to The English Electric Company Limited, London, England**

**Filed Aug. 5, 1968, Ser. No. 750,064**
**Claims priority, application Great Britain, Aug. 3, 1967, 35,634/67**
**Int. Cl. H01h** *47/18*
**U.S. Cl. 317—36 TD** **11 Claims**



This invention relates to an overcurrent relay in which a voltage is developed proportional to the current in an AC circuit, a two-state switch is responsive to an overcurrent condition in which the monitored voltage periodically exceeds a reference level whereby to assume one state for the duration of these periods during which this level is exceeded, a storage circuit progressively accumulates a voltage from a datum level during each period for which the switch is in its other state, and a timer is operable whenever the switch assumes its one state to actuate an output device after a predetermined delay, the timer being reset by the storage circuit each time its voltage attains a predetermined magnitude.

The maximum "overshoot" of the relay, i.e., the effect which could cause the output device to operate and effect protective action even with an unsustained overcurrent, may be contained within a period just in excess of one cycle, or even less, and the pickup/dropoff ratio of the output device can practically approach the optimum value of 100 percent.

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**3,644,790**

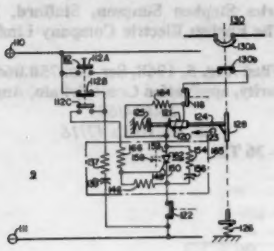
## STATIC ANTIPUMP CIRCUIT BREAKER CLOSING SYSTEM

**John M. Kozlovic, Greensburg, and William H. South, McKeesport, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Mar. 25, 1970, Ser. No. 22,522**
**Int. Cl. H02h** *1/00*
**U.S. Cl. 317—54** **4 Claims**

The use of a charged capacitor in conjunction with the closing switch associated with a circuit breaker such that when the closing switch is closed, the capacitor discharges through the switch and the primary of a pulse transformer creating a pulse in the secondary of the transformer which, in turn, is used to gate a solid-state control device such as a triac or silicon controlled rectifier. The cathode and anode of the solid-state control device is in electrical series with the

closing switch and the spring release coil of the circuit breaker, such that when the previously mentioned pulse is applied it causes the solid-state device to turn on and conduct current through the spring release coil thus actuating the closing of the circuit breaker. In the event the circuit



breaker immediately reopens because of a fault in the protected circuit or a similar circumstance, the circuit breaker will not reclose again until the depressed closing switch is opened, thus allowing the aforementioned capacitor to recharge.

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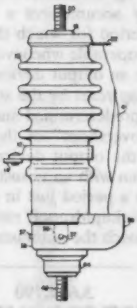
**3,644,791**

**LIGHTNING ARRESTER WITH PRESSURE RELIEF MEANS**

**Charles H. Carothers, and Philip W. Bogner, both of Bloomington, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed July 29, 1970, Ser. No. 59,177**
**Int. Cl. H02h *1/04***
**U.S. Cl. 317—66** **6 Claims**



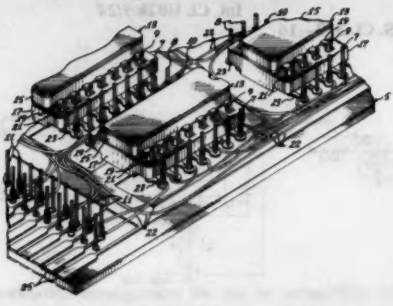
Electrical surge protection apparatus, such as lightning arresters, in a fracturable housing are provided with a flexible diaphragm closing an opening of the housing and resting in a support means that has one or more projections extending substantially parallel with the diaphragm when it is unstressed. Pressure buildup within the housing causes the diaphragm to be distended and to rupture due to cutting by the projections. Such pressure relief means can be implemented in arresters that have provision for creation of an external arc upon failure so that within a structure that is simple and relatively easy to fabricate there can be provided both pressure venting and arc transfer means.

**3,644,792**

**REUSABLE CIRCUIT BOARD FOR CONSTRUCTING LOGIC CIRCUITS USING INTEGRATED CIRCUIT ELEMENTS**

**John H. Fields, Phoenix, Ark., assignor to Honeywell Information Systems Inc., Ariz.**

**Filed July 2, 1970, Ser. No. 51,873**
**Int. Cl. H05k *1/18, 3/32***
**U.S. Cl. 317—101 CC** **6 Claims**



The device disclosed utilizes a circuit board having pin connectors mounted thereon for use in combination with an integrated circuit package and a demountable solderless connector for mounting the package on the board. The combination, depending upon the electrical connections to the pin connectors, allows various types of logic structures to be designed and laid out many times over without degrading or damaging the circuit board or the electronic elements.

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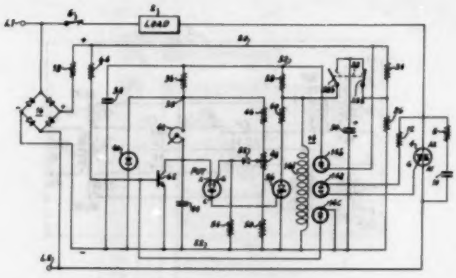
**3,644,793**

**TIMED "ON" CYCLE ELECTRONIC TIMING SYSTEM**

**Ronald J. Ilk, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.**

**Filed May 1, 1970, Ser. No. 33,714**
**Int. Cl. H01h *47/18***
**U.S. Cl. 317—141 S** **8 Claims**



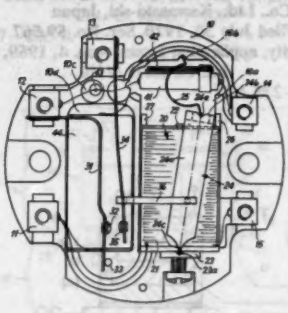
An AC interval timer for controlling any AC load such as the lamp of an infrared heating device, motor, solenoid valve or the like. The timing system is supplied through a rectifier from the same AC source that supplies the load and provides a timed "on" cycle after momentary operation of an activating switch. Features include a pulse input that causes latching of the load "on" and prevents false triggering, a timing circuit that incorporates temperature compensation and good power supply stability characteristics, and a reset clamp to insure accurate repeatability and recycling.

3,644,794

## ELECTRICAL REMOTE-CONTROL SWITCH

Rene Develay, 44, Rue des Tilleuls, Boulogne, France

Filed Feb. 8, 1971, Ser. No. 113,583
Claims priority, application France, Feb. 12, 1970, 7005059
Int. Cl. H01h 47/00
U.S. Cl. 317—151 6 Claims



An electrical remote-control switch assembly, comprising electromagnet means embodying a coil, a fixed core and a movable armature, and an electrical contact mechanism incorporating a movable blade, said armature being operatively connected with said movable blade. A control current circuit serves for pulse excitation of the armature, the coil being arranged in said control current circuit. According to the invention the core of the electromagnet possesses a substantially T-shaped configuration including a central leg portion which carries said coil and a transverse leg member, while the movable armature possesses a substantially U-shaped configuration embodying a pair of legs interconnected by a transverse web, said pair of legs extending externally of said coil at opposite sides thereof. The free ends of these legs are pivotably connected with opposite end portions of the transverse leg member of said T-shaped core, and stop means limit the pivotal movement of the armature between two stable terminal positions symmetrically situated relative to the central leg portion of said core. The contact mechanism is open when the movable armature assumes its one terminal position and closed when the armature assumes its other terminal position. A pivotable spring is mounted between the armature and a support point which is fixed relative to the core, this spring striving to displace the armature into each one of its two stable terminal positions and ensuring for an unstable condition of the armature in its central position intermediate such two stable terminal positions where the transverse web of the armature is located in front of the free end of the central leg portion of the core.

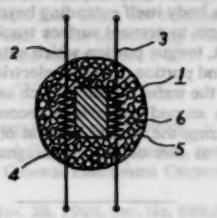
3,644,795

## GAS DETECTING ELEMENT AND METHOD OF MAKING IT

Nsoyoshi Taguchi, 6-8, 2-chome, Hyuga, Torum-ku, Kobe, Japan

Filed Nov. 17, 1970, Ser. No. 90,271
Claims priority, application Japan, Dec. 19, 1969, 44/102827
Int. Cl. H01g 9/00
U.S. Cl. 317—230 5 Claims

A gas detecting element which is formed of a semiconductor material having electrodes embedded therein and wherein at least one substance is added to the material which produces silica or silica gel when oxidized, heated or hydrolyzed.

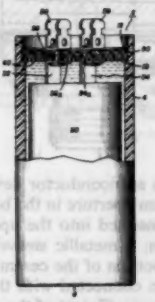



3,644,796

## ELECTROLYTIC CAPACITOR HAVING INTEGRAL BLEEDER RESISTOR

John W. Carino, Columbia, S.C., assignor to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,527
Int. Cl. H01g 1/02, 9/00
U.S. Cl. 317—230 5 Claims

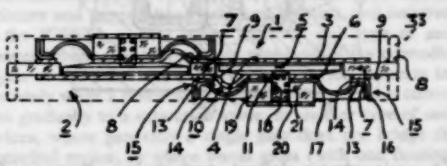


An electrolytic capacitor is provided having an integral bleed resistor therein to eliminate the need for an external resistor. The internal bleed resistor is provided by constructing the cover of the capacitor from which the leads protrude of a material which is slightly conductive. Carbon-filled plastics can be used to form the slightly conductive cover.

3,644,797

## SEMICONDUCTOR ASSEMBLY INCLUDING APERTURE-MOUNTED, DIAPHRAGM-SUPPORTED WAFER

Victor J. Carter, London, England, assignor to Westinghouse Brake English Electric Semi-Conductors Limited, London, England

Filed Apr. 21, 1970, Ser. No. 30,556
Claims priority, application Great Britain, Apr. 30, 1969, 22,050/69
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 10 Claims

A semiconductor assembly including a insulating planar body having a semiconductor wafer mounted in aperture ex-

tending between the major faces thereof. A pair of electrically and heat-conducting diaphragms hermetically sealed to the body close off the ends of aperture and support the wafer therewithin, the body itself extending beyond the peripheries of the diaphragms to prevent surface tracking. A conductor, including a first, tongue portion which extends into the aperture and a second portion, provides electrical contact with an inner region of the wafer. A pair of such assemblies is formed by mounting a second wafer in a second aperture in the body, and utilizing the second portion of the conductor of each assembly as one of the diaphragms of the other assembly.

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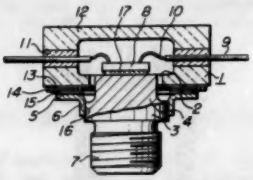
**3,644,798**

**HIGH-POWER INTEGRATED CIRCUIT CERAMIC PACKAGE WITH METALLIC HEAT-CONDUCTING BODY**

**Takahiko Ihochi, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed June 5, 1970, Ser. No. 43,787**
**Claims priority, application Japan, June 16, 1969, 44/55882**
**Int. Cl. H01l *3/00, 5/00***
**U.S. Cl. 317—234 R** **10 Claims**




An enclosure for a semiconductor device provided with a ceramic case having an aperture in the bottom; a heat-radiating portion loosely inserted into the aperture and having a cylindrical protrusion; a metallic sleeve with a flat portion connected with the bottom of the ceramic case and a hollow cylindrical protrusion connected with the radiating portion, the thermal expansion coefficient of the metallic sleeve being substantially equal to that of the ceramic case; and a cover for forming a space for accommodating a semiconductor substrate and the ceramic case; whereby the thermal distortion generated between the radiating portion and the metallic sleeve can be absorbed by said hollow cylindrical protrusion.

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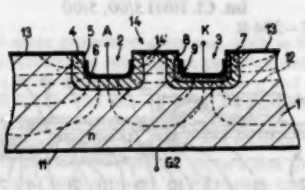
**3,644,799**

**SEMICONDUCTOR ELEMENT HAVING AT LEAST ONE CONTROL ELECTRODE**

**Erich Weisshaar, Aargau, Switzerland, assignor to Transistor AG, Zurich, Switzerland**

**Filed Mar. 19, 1970, Ser. No. 21,067**
**Claims priority, application Switzerland, Mar. 21, 1969, 4315/69**
**Int. Cl. H01l *1/00***
**U.S. Cl. 317—235 R** **6 Claims**




A semiconductor element, particularly a disconnectable thyristor comprises at least one control electrode and a semiconductor body having a surface region of a determined conductivity-type. One or more zones of another conductivity-type are diffused into said surface region and are surrounded by regions of said determined conductivity-type. Said zones of another conductivity-type are each contained in a pit and the wall regions of the pit exhibit the conductivity-type of the respective zones. Said pits preferably are comb-shaped and arranged with interengaging comb teeth.

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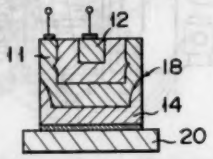
**3,644,800**

**SEMICONDUCTOR-CONTROLLED RECTIFYING DEVICE**

**Yukio Igarashi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed July 30, 1970, Ser. No. 59,567**
**Claims priority, application Japan, Aug. 4, 1969, 44/61044**
**Int. Cl. H01l *11/10***
**U.S. Cl. 317—235 AB** **2 Claims**




A controlled rectifying device comprising a four-layer wafer, wherein a first layer of N-type, second layer of P-type and fourth layer of P-type respectively include cathode, gate and anode electrodes. To one side of the wafer is attached the cathode electrode, and to the opposite side are the anode and gate electrodes.

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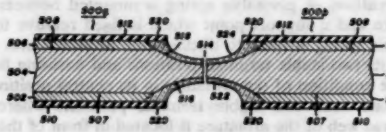
**3,644,801**

**SEMICONDUCTOR PASSIVATING PROCESS AND PRODUCT**

**Gary S. Sheldon, 14 Seminary St., Union Springs, N.Y.**

**Continuation of application Ser. No. 782,093, Dec. 9, 1968, now abandoned. This application Jan. 21, 1971, Ser. No. 108,569**
**Int. Cl. H01l *1/10, 5/00, 7/66***
**U.S. Cl. 317—235 R** **2 Claims**



A semiconductive wafer is selectively protected and etched so that a grid of intersecting grooves is formed on one or both major surfaces. The grooves extend below junction depth. Oxide lip portions overhanging the grooves may be removed and the grooves may be treated to enhance wettability. A passivant is then selectively electrophoretically deposited into the grooves. Where glass is employed the passivant it is fired after deposition. The wafer may be subdivided into pellets before or after contacts are applied. A pliant supplemental passivant encapsulates the semiconductive pellet, and a casement is molded thereabout to complete

the device. One semiconductive element that may be obtained by the passivation process is characterized by a passivant coating on a beveled periphery that progressively increases in thickness as it approaches a major surface intersecting the beveled periphery.

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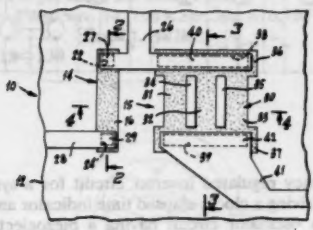
**3,644,802**

**RATIO-COMPENSATED RESISTORS FOR INTEGRATED CIRCUIT**

**Andrew G. F. Dingwall, Somerville, N.J., assignor to RCA Corporation**

**Filed May 31, 1968, Ser. No. 733,374**
**Int. Cl. H01l 11/00**
**U.S. Cl. 317—235 R** **10 Claims**



The ratio of the resistances of two diffused integrated circuit resistors of dissimilar geometries is made relatively insensitive to processing variations in the structure of the resistors in different devices. Wider resistors in a given device are made more sensitive to width variations to match the greater sensitivity of narrower resistors in that device, and longer resistors are made more sensitive to length variations to match the greater sensitivity of shorter resistors. Lower value resistors are made less sensitive to metallurgical phenomena that affect contact resistance so that proportionally less contact resistance change is produced by a given processing variation in the lower value resistors than in the higher value resistors.

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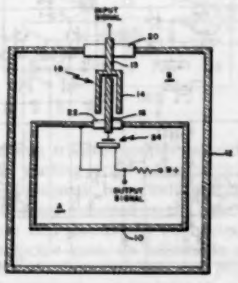
**3,644,803**

**ELECTRICAL CONNECTIONS TO LOW TEMPERATURES**

**Mark W. Levi, Utica, N.Y., assignor to The United States of America as represented by the Secretary of the United States Air Force**

**Filed Mar. 18, 1969, Ser. No. 808,123**
**Int. Cl. H01l 11/14**
**U.S. Cl. 317—235 R** **1 Claim**



An electrical lead-in conductor is effected from ambient to a cryogenic receptacle by means of a vacuum capacitor located in a vacuum surrounding the cryogenic receptacle. One plate of the capacitor leads from ambient to the vacuum area, the other from the vacuum area through the inner wall to the cold area. Heat leak along the conducting element is prevented by the break in the conducting element which the capacitance form of the lead affords.

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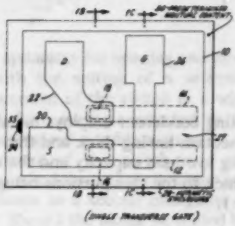
**3,644,804**

**TIME DELAY IGFETS**

**Earl S. Schlegel, and George L. Schnable, both of Lansdale, Pa., assignors to General Instrument Corporation, Newark, N.J.**

**Filed Nov. 28, 1969, Ser. No. 880,644**
**Int. Cl. H01l 11/14**
**U.S. Cl. 317—235 R** **1 Claim**



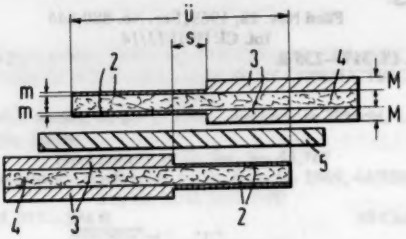
Time delay devices, each an enhancement-type Insulated Gate Field Effect Transistor (IGFET) which comprises (1) a substrate entirely of one conductivity type having at the surface thereof source and drain regions of the opposite conductivity type, and (2) a conductive gate or gates, overlying but insulated from said substrate. If the device includes one gate, it may overlie either (a) part of the controlled region of the substrate between the source and drain regions, or (b) portions of the substrate remote from said controlled region. If the device includes plural gates, one gate has a floating potential and overlies the controlled region of the substrate, and the other biased gate overlies a portion of the substrate remote from said controlled region. When the source-drain circuit is biased conventionally, the application of a potential of the proper polarity to the gate will cause a charge to migrate slowly from the gate over the surface of the IGFET. As the charge covers the controlled region, it induces a change in conductivity type in the surface of the portion of the controlled region which it covers, thereby causing the source-drain circuit to become fully conductive after a predetermined delay. The delay is dependent upon ambient moisture and temperature, gate configuration, and resistivity of the IGFET's surface oxide layer. In one type of such devices, where generally a single gate bridges the controlled region of the substrate, a source-drain current appears immediately when a potential is applied to the gate; this current rises gradually to a saturation value. In another type of such devices, where generally a single gate does not bridge the controlled region, or where plural gates (with one floating) are used, the source-drain current begins only a given time after the application of a potential to the gate but then increases relatively rapidly to saturation value.

3,644,805

## REGENERATABLE ELECTRIC CONDENSER

Hermann Heywang, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 17, 1970, Ser. No. 55,779
Claims priority, application Germany, July 28, 1970, P 19 38 319.8
Int. Cl. H01g 1/14, 3/15
U.S. Cl. 317—258 7 Claims



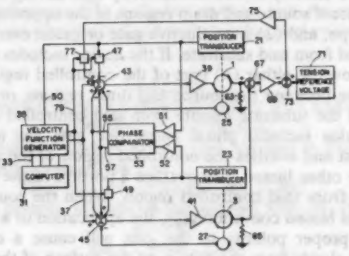

A regenerating condenser employs metal layers in a step-shaped cross section having thick and thin portions, the thin portions having low-heat capacity and the electrical conductivity of the thick to the thin portions being a preferred ratio of at least 1.5:1.

3,644,806

## HIGH-SPEED PRINTER-PAPER FEED ENGINE

Ross A. Belson, Natick, and Gaston A. Palombo, Chelmsford, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 24, 1970, Ser. No. 22,235
Int. Cl. H02p 5/52
U.S. Cl. 318—7 14 Claims



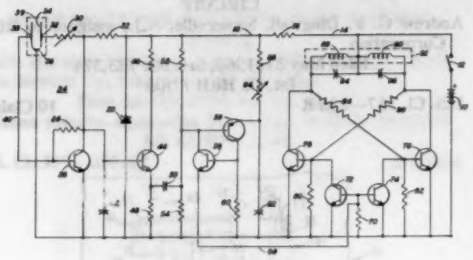

A high-speed incremental web transport system especially suited for a high-speed printer application includes two motors with velocity feedback driven from a common controller in accordance with a computer originated movement request. Incremental position transducers allow precise repetitive spacing and positional stability of the motor shafts. Differential tension to be created during printing periods is obtained by controlling motor current. Synchronization control for skip-type movements prevents a buildup of positional error.

3,644,807

## FREQUENCY REGULATED INVERTER CIRCUIT FOR A SYNCHRONOUS MOTOR

Chester J. Zajac, Thomaston, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 28, 1970, Ser. No. 32,639
Int. Cl. H02k 29/00
U.S. Cl. 318—138 23 Claims



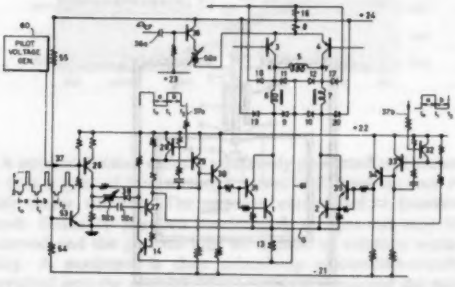
A frequency regulated inverter circuit for a synchronous motor for driving a clock, elapsed time indicator and the like, includes an oscillator circuit having a piezoelectric tuning fork filter in a feedback path thereof for generating a stable alternating current output signal having a frequency substantially equal to the resonant frequency of the tuning fork; the alternating current signal from the oscillator is wave-shaped, differentiated, and fed to the input of a frequency divider producing an output pulse upon the receipt of every sixth differentiated alternating current signal. The output pulse from the frequency divider is, in turn, fed through a steering network to a pair of switching transistors for alternately energizing a synchronous motor which can be used for driving a clock mechanism, elapsed time indicator or similar timing mechanisms.

3,644,808

## MEANS FOR PROTECTING ELECTRONIC COMMUTATION MOTOR FROM ACCIDENTAL OVERLOAD

Robert Favre, 36 Rue de Servan 1000, Lausanne, Switzerland

Continuation-in-part of application Ser. No. 641,566, May 26, 1967, now abandoned. This application Oct. 26, 1970, Ser. No. 83,754
Claims priority, application Switzerland, May 27, 1966, 7710/66; 7711/66
Int. Cl. H02k 29/00
U.S. Cl. 318—138 17 Claims




An induction motor fed from a DC source is commutated by a transistor bridge controlled by a pilot voltage. A voltage

proportional to motor current is fed back to the control circuit to cut off the respective commutation elements when the motor current becomes excessive. Auxiliary transistorized circuits protect the commutating elements against overload by induced reaction current and provide a braking current for the motor when the supply current is abruptly cut off. Diodes associated with induction coils protect the commutation circuit against reversal of the nominal polarity of the commutating transistors. The effective number of ampere-turns in the motor winding is increased during starting and when running at low speed to protect the commutating elements from overload while providing high torque.

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**3,644,809**

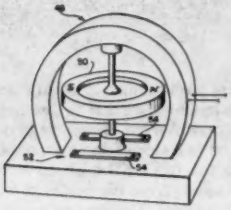
**SELF-STARTING FOR DC MOTORS**

**Reinhard N. Lahde, Los Altos, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Nov. 14, 1969, Ser. No. 876,757**

**Int. Cl. H02k** *29/00*

**U.S. Cl. 318—138** **9 Claims**



A noncommutating self-starting direct current motor having a magnetic rotor which turns through a position in which the motor field produces no driving torque on the rotor and a position in which the field produces maximum driving torque on the rotor, and positioning means for arresting the rotor in its maximum torque position when the motor field is turned off so as to condition the motor for automatic restarting when the field is restored.

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**3,644,810**

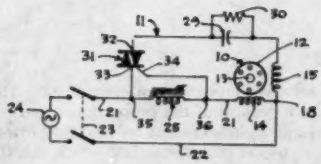
**SENSING AND CONTROL DEVICE FOR ELECTRIC MOTOR-STARTING CIRCUITS**

**Alexander J. Lewus, 9844 North 11th Ave., Phoenix, Ariz.**

**Filed Jan. 20, 1971, Ser. No. 108,029**

**Int. Cl. H02p** *1/42*; **H01f** *21/06*

**U.S. Cl. 318—221 E** **6 Claims**



A versatile sensing transformer for actuating a semiconductor gate in the starting circuit of an electric motor, comprising a U-shaped magnetic base, inductive coupled primary and secondary windings mounted on the base in coaxial relation to each other and electrically connected to the motor and the semiconductor gate, an adjustable and removable magnetic core threaded into the base and projecting axially of the cores, and a magnetic cap bridging the open end of the base to form a complete magnetic shell, the cap being adjustable toward and away from the coils and core to vary the overall reluctance of the magnetic circuit.

**3,644,811**

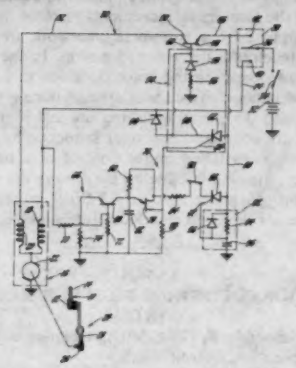
**POWER WINDOW PULLDOWN CIRCUIT**

**Samuel B. Robbins, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 24, 1970, Ser. No. 66,478**

**Int. Cl. H02h** *7/097*

**U.S. Cl. 318—266** **6 Claims**



Power window apparatus for opening and closing a window in accordance with the setting of a selectively operable switch. Upon placement of the switch in a window opening setting a window drive motor connected to the window is placed in a first energized condition so as to open the window. Upon placement of the switch in a window-closing setting power is supplied through a transistor to the motor so as to place the motor in a second energized condition and close the window. Should the motor be stalled by the window being closed on an obstacle the window travel is reversed by the resultant decrease in the voltage across the motor armature causing a bias network to both turn off the transistor and place the motor in the first energized condition. A limit switch that is responsive to the window position is provided to prevent the armature voltage from effecting reversal of the window when the window is substantially closed so as to allow the motor to seal the window. A time delay network is provided for preventing voltage transients generated upon starting the motor from effecting reversal of the window travel during a predetermined time.

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**3,644,812**

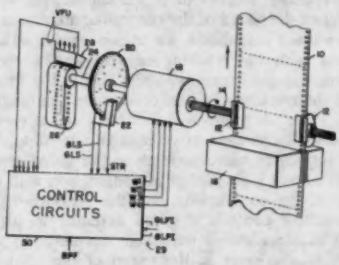
**WEB FEED APPARATUS WITH STEPPING MOTOR DRIVE**

**Joseph R. Bitto, Peabody, and Clifford M. Hammel, Winchester, both of Mass., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.**

**Filed Nov. 17, 1969, Ser. No. 877,355**

**Int. Cl. H02k** *29/00*

**U.S. Cl. 318—254** **3 Claims**




A web feed device of the type such as may be used to step-feed a print form line-by-line through a printer employs a 48-

pole, four-phase, 192-increment/rev. stepping motor for feeding a web in either sixth or eighth inch steps. In the eight step per inch mode of operation the motor rotor is driven to advance through six angular increments for each feed step. During the first three increments of excursion pulses generated by a strobe disk fixed to the motor shaft are supplied to the motor in a sequence phased to accelerate the rotor. During the final three increments of rotor excursion pulses are supplied by a time-delay network in a sequence phased to decelerate the rotor to a stop. In the six step per inch mode of operation the rotor is driven through an eight increment excursion cycle, accelerating during the first four increments and decelerating during the last four. The motor input leads are energized in proper sequence by an encoding matrix which is switched under control of a timing ring or shift register. Slewing is effected by driving the shift register with a train of phase-delayed shifting pulses interposed between the acceleration and deceleration pulses.

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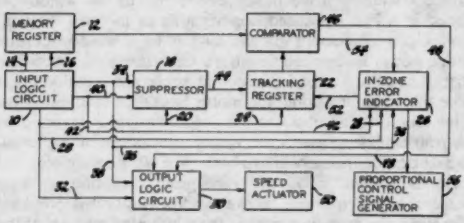
## 3,644,813
## PROPORTIONAL CONTROL DIGITAL SPEED CONTROL SYSTEM

**Arthur J. Schoendorff, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed June 22, 1970, Ser. No. 48,073**
**Int. Cl. H02p *5/06*; G05b *19/26***
**U.S. Cl. 318—318** **5 Claims**

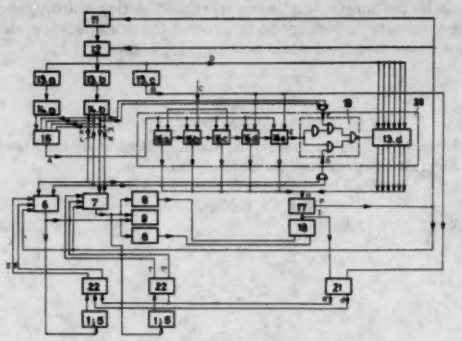



A proportional control digital speed control system for a controlled apparatus having an input logic circuit which supplies a number of pulses to a memory register to generate and store therein a binary number representing a desired speed of the controlled apparatus. The input logic circuit supplies a clock pulse and a series of pulses having a frequency corresponding to the speed of the controlled apparatus to a suppressor such that the number of pulses which occur during the clock pulse represents the actual speed of the controlled apparatus. The suppressor suppresses a predetermined number of the pulses occurring at the beginning of the clock pulse and supplies the remaining number of pulses which occur during the clock pulse to a tracking register to generate therein a binary number which is equal to the number which represents the actual speed of the controlled apparatus less the number of pulses suppressed by the suppressor. When the speed of the controlled apparatus is within a predetermined magnitude, an in-zone error indicator, in conjunction with the tracking register and a comparator which compares the binary numbers within the memory register and the tracking register, determines the magnitude of the speed error. A proportional control signal generator is responsive to the in-zone error indicator to supply a signal having a duty cycle corresponding to the speed error determined. An output logic circuit in conjunction with the input logic circuit, the comparator, and the proportional control signal generator controls a speed actuator to provide for maximum acceleration or maximum deceleration when the magnitude of the error in the speed of the controlled apparatus exceeds the predetermined magnitude and to provide for varying degrees of acceleration or deceleration when the magnitude of the error in the speed of the controlled apparatus is within the predetermined magnitude.

## 3,644,814
## FINE POSITIONING SYSTEM

**Gunter Firkert, Dresden, Germany, assignor to Veb Elektromat, Dresden, Germany**

**Continuation-in-part of application Ser. No. 811,144, Mar. 27, 1969. This application Feb. 16, 1970, Ser. No. 11,571**
**Int. Cl. G05b *11/18***
**U.S. Cl. 318—592** **10 Claims**



The drive system positioning a drum at a selected point on a raster has a disc mounted on it. The disc has slots spaced at different radial distances from the center in different sectors. A light is placed on one side of the disc, photoelectric transducing means on the other. The photoelectric transducers are each spaced radially from the center at a distance to correspond to one of the slots. The starting position of the disc is coordinated to one point. A complete rotation of the disc corresponds to the distance between points. Light on a specific photoelectric transducer thus signifies the deviation of the drum from the selected point.

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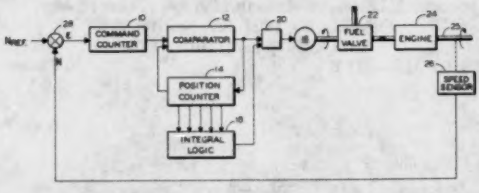
## 3,644,815
## DIGITAL P.I. SERVOCONTROL SYSTEM

**Ronald E. Falk, Bristol, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.**

**Filed Nov. 10, 1969, Ser. No. 875,463**
**Int. Cl. G05b *11/36***
**U.S. Cl. 318—609** **8 Claims**




A digital servosystem having an integral path. The integral path includes a portion of the proportional step motor control circuitry and includes means for providing low-frequency control pulses to the motor at a rate which is a function of the proportional position of the actuator being controlled.

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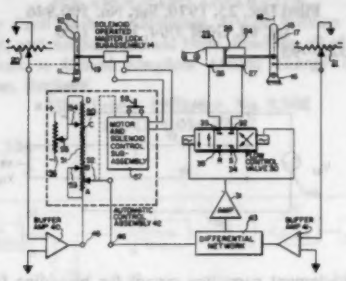
## 3,644,816
## MANUAL AND AUTOMATIC MASTER-SLAVE CONTROL SYSTEM

**Kendall E. Gilbert, Schenectady, N.Y., assignor to General Electric Company**

**Filed Dec. 21, 1970, Ser. No. 99,787**
**Int. Cl. G05b *1/06***
**U.S. Cl. 318—663** **4 Claims**

A control system including a slave member and a master member for maintaining the slave member in alignment with

the master member in response to the movements thereof. Means are provided for moving the slave member through a cycle of automatic operation starting from a position of alignment with the master member and returning to a position of alignment with the master member thereby facilitating transferring of the system from manual to automatic control and return.



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**3,644,817**

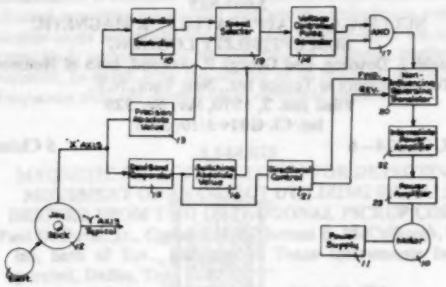
**PLURAL SUPPLY STEPPER MOTOR CONTROL SYSTEM**

**Philip J. Rosen, Oak Park, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.**

**Filed June 19, 1969, Ser. No. 834,750**

**Int. Cl. H02v *37/00***

**U.S. Cl. 318—696** **3 Claims**



A stepper motor control system comprising a constant current motor supply for exciting the various phases of the motor and means for converting a bipolar control signal into a unipolar signal which in turn controls the rate of pulses for successively energizing various phases of the motor. The system further includes means responsive to the bipolar signal for controlling the direction of movement of the motor. The constant current supply is responsive to the speed of the motor independently of the pulse rate to change the excitation of the motor from the constant current supply to a low-voltage constant voltage supply when the speed of the motor is reduced below a predetermined value.

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**3,644,818**

**ELECTRONIC FLASHLAMP POWER SUPPLY**

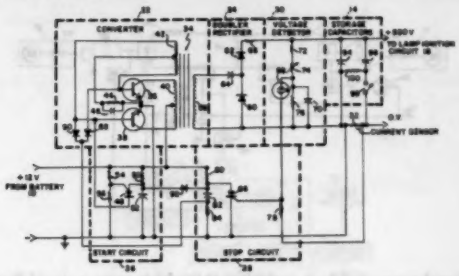
**Fredrick W. Paget, Hamilton, Mass., assignor to GTE Sylvania Incorporated**

**Filed Mar. 10, 1971, Ser. No. 122,793**

**Int. Cl. H02m *1/08***

**U.S. Cl. 321—18** **12 Claims**

A flash system power supply for charging a storage capacitor employed in operating a flashlamp. A battery-powered multivibrator-type converter is coupled to the storage capacitor through a transformer-rectifier circuit, with the multivibrator being triggered into oscillation by a start circuit comprising a relaxation oscillator. Multivibrator operation is squelched by a negative voltage pulse from a stop circuit controlled by a relaxation oscillator-type voltage detector which senses a predetermined charge on the storage capacitor. The stop circuit is also controlled by a current-sensing resistor which detects discharge of the storage capacitor. Operation of the start circuit is clamped to the stop circuit through a diode, with the stop circuit having a time constant sufficient to delay restarting of the multivibrator beyond the deionization period of the flashlamp.



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**3,644,819**

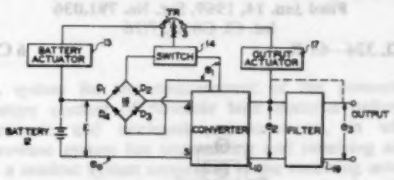
**CONVERTER CIRCUIT FOR AC TO DC WITH FEEDBACK MEANS**

**Stuart P. Jackson, 1723 Grace Lane, Columbus, Ohio**

**Filed July 14, 1969, Ser. No. 841,235**

**Int. Cl. H02m *3/32***

**U.S. Cl. 321—20** **7 Claims**



This invention relates to a circuit for converting direct current electric power into alternating current electric power. Specifically, the invention relates to a converter utilizing a combination of simple modulation by means of feedback to produce an output containing reduced voltage variation and maintaining commutating circuit capability.

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**3,644,820**

**CONTROL CIRCUITS FOR INVERTERS**

**John Desmond Ainsworth, Stafford, England, assignor to The English Electric Company, Limited, London, England**

**Filed May 11, 1970, Ser. No. 36,155**

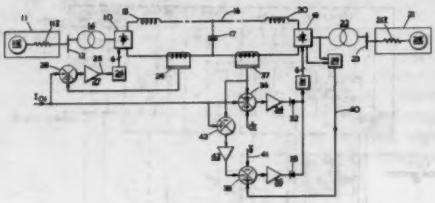
**Claims priority, application Great Britain, May 9, 1969, 23,662/69**

**Int. Cl. H02m *5/14***

**U.S. Cl. 321—52** **6 Claims**

In the transmission of direct current from a rectifier to an inverter one method of control has been to provide a constant current at the rectifier and a constant extinction angle at the inverter controlled by a fixed extinction angle order signal. Instability results with this form of control under certain operating conditions. In the present invention the tendency to instability is reduced by controlling the extinction

angle of the inverter in accordance with the fixed order signal when the inverter output current is at least equal to a required level, but increasing the extinction angle when the inverter current is less than the required level. The extinction angle is increased under the control of an auxiliary order



signal generated by a summing unit which sums a signal from a control circuit representing the actual extinction angle, the fixed order signal, and a signal from an amplifier dependent on the difference between the actual and required current levels.

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**ERRATUM**

For Class 323—93 see:
Patent No. 3,644,822

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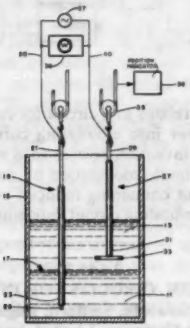
**3,644,821**

**CAPACITANCE METHOD AND APPARATUS FOR DETECTING AN INTERFACE BETWEEN ELECTRICALLY CONDUCTIVE IMMISCIBLE LIQUIDS**

**Jack L. Long, Arvada, Colo., assignor to The United States of America as represented by the United States Atomic Energy Commission**

**Filed Jan. 14, 1969, Ser. No. 791,036**
**Int. Cl. G01r** *27/26*
**U.S. Cl. 324—61 R** **6 Claims**



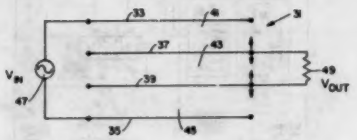
An interface level detector comprising a pair of electrodes each positionable in electrical contact with contiguous immiscible liquids wherein at least one of said liquids is electrically conductive, a source of alternating current in electrical series with the electrodes, means for moving one of said electrodes to the interface of said liquids and a voltage indicator electrically connected to said source of alternating current for sensing a change in electrical charge when said moving electrode reaches the interface between the liquids.

**3,644,822**

**VARIABLE POSITION MULTIELEMENT CAPACITOR VOLTAGE TRANSFORMER DEVICE**

**Orestes M. Baycura, 2238 Central Park Drive, Campbell, Calif.**

**Filed Dec. 23, 1970, Ser. No. 100,946**
**Int. Cl. G05f** *3/04;* **H03c** *3/20*
**U.S. Cl. 323—93** **4 Claims**




A multielement capacitor circuit for providing frequency mixing and voltage stepdown functions. One embodiment comprises a three element capacitor circuit where a first AC input signal is applied to the two outer capacitor plates and a second AC input signal is applied to the center capacitor plate and to one of the outer capacitor plates. Also, load resistors may be placed in series with the two input signals or in parallel with the second AC input signal. A variable voltage stepdown function is obtained across only one of the load resistors by physically changing the spacing of the center capacitor plate with respect to the two outer capacitor plates. The mixed frequency signal is obtained across any one of the load resistors. Another embodiment comprises a four element capacitor circuit.

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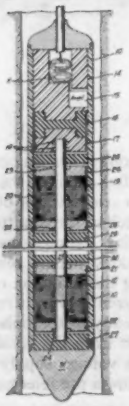
**3,644,823**

**NULLING COIL APPARATUS FOR MAGNETIC SUSCEPTIBILITY LOGGING**

**Donald J. Dowling, and George R. Atwood, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed Jan. 2, 1970, Ser. No. 329**
**Int. Cl. G01v** *3/10, 3/18*
**U.S. Cl. 324—6** **5 Claims**



Disclosed is an improved logging apparatus having sufficient sensitivity and environmental stability suitable for magnetic susceptibility logging which includes a transmitter search coil, a receiver search coil, a power supply for providing alternating current power to the transmitter coil and an improved nulling coil including a primary winding wired in series opposition with the receiver coil. The nulling coil includes construction and mounting features uniquely suitable to render detectable the small quadrature phase signal

representing the magnetic susceptibility of borehole formations.

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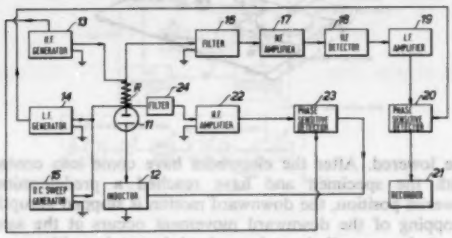
**3,644,824**

## POLAROGRAPH APPARATUS

**Geoffrey Cecil Barker, Abingdon; Arthur William Gardner, Didcot, and Anthony Gerald Pope, Reading, all of England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Filed Feb. 9, 1970, Ser. No. 9,908**
**Int. Cl. G01n 27/42**
**U.S. Cl. 324—31** **7 Claims**




Polarographic cell impedance components which are potential dependent are detected by applying a high-frequency and a low-frequency voltage simultaneously across the cell. The variation in impedance produced by the low-frequency voltage results in amplitude modulation of the high-frequency current through the cell. The amplitude modulation is detected. The impedance components thus indicated comprise principally the faradaic impedance and the double-layer electrode capacity. The double-layer electrode capacity is compensated by inserting an inductor, preferably variable, in series with the cell so as to resonate at the high frequency with the double-layer electrode capacity.

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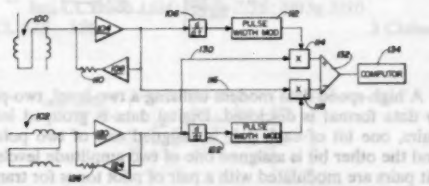
**3,644,825**

## MAGNETIC DETECTION SYSTEM FOR DETECTING MOVEMENT OF AN OBJECT UTILIZING SIGNALS DERIVED FROM TWO ORTHOGONAL PICKUP COILS

**Paul D. Davis, Jr., Garland, and Thomas E. McCullough, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 31, 1969, Ser. No. 889,574**
**Int. Cl. G01r 33/00**
**U.S. Cl. 324—41** **15 Claims**




A pair of magnetic field sensors are disposed perpendicular to one another for sensing, at a single location, different directional components of a magnetic field. The output signals from the magnetic field sensors are vectorally combined to provide vector representations of the varying magnetic field. The direction of movement of the vector representations is then determined in order to indicate either the direction of movement of the object creating the variations in the magnetic field or the relative position of the object with respect to the sensors.

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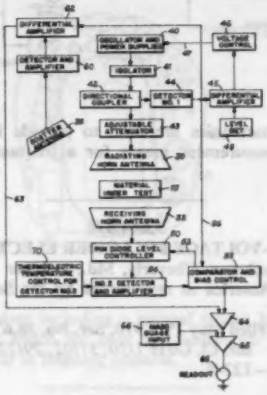
**3,644,826**

## MOISTURE-MEASURING SYSTEM USING MICROWAVE AND NUCLEONIC MEASUREMENTS

**Wendell H. Cornetet, Jr., Columbus, Ohio, assignor to Industrial Nucleonics Corporation**

**Filed Apr. 3, 1967, Ser. No. 628,066**
**Int. Cl. G01r 27/04**
**U.S. Cl. 324—58.5** **9 Claims**




A system for the measurement of the percentage of moisture content of flowable bulk material online using microwave and nucleonic measurements, in which a microwave system has transmitting and receiving antennas and a readout system connected to the receiving antenna to measure the attenuation of the microwave signal including a third antenna to pick up scattered microwave energy to apply to the microwave readout a correction in accordance with the level of the scattered energy, the accuracy of readout being maintained by a PIN diode modulator in the output of the receiving antenna with a bias control loop for maintaining a constant output with the bias signal applied to the PIN diode representing moisture content of the material following correction in accordance with the scattered energy, and in which variations in mass are corrected by a nucleonic mass measuring gauge with its rays being aligned in intersecting relation with the microwave energy at the material being measured.

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**3,644,827**

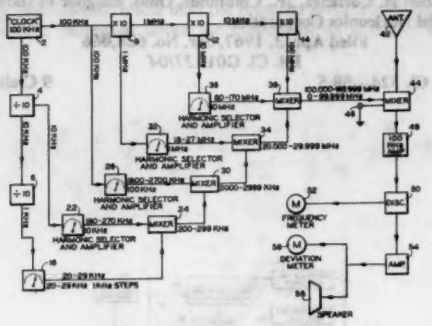
## FREQUENCY SYNTHESIZER METHOD FOR ADDING MIXED HARMONICS WHICH CORRESPOND TO SIGNIFICANT DIGITS OF THE SYNTHESIZED FREQUENCY

**Edgar E. Landefeld, 1135 Durham Cir., Massillon, Ohio**

**Filed May 27, 1969, Ser. No. 828,241**
**Int. Cl. G01r 23/14; H03b 21/00**
**U.S. Cl. 324—79 R** **4 Claims**

A method of synthesizing a series of frequencies from a single source utilizing the process of moving the individual

frequencies upward in the frequency spectrum before they are mixed. Specifically, a standard crystal controlled frequency and its harmonics are used to provide frequency and deviation measurement means for a frequency modulated (FM) signal.



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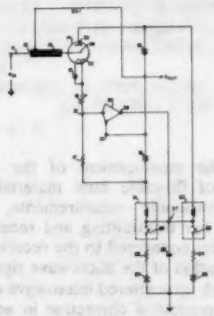
**3,644,828**

**DC HIGH-VOLTAGE FOLLOWER ELECTROMETER**

**Stuart G. Gathman, Cheverly, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed May 19, 1970, Ser. No. 38,675**
**Int. Cl. G01r 1/30, 31/02, 29/22**
**U.S. Cl. 324—123 R** **3 Claims**



A high-input impedance electrometer tube for measuring high-atmospheric electric potentials where the high-input impedance is provided by a guard voltage (equal to the atmospheric voltage measured) supplied by a charged capacitor capable of large positive and negative excursions.

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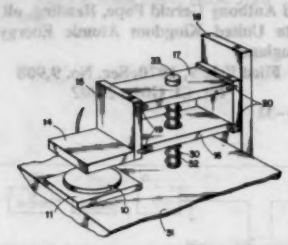
**3,644,829**

**APPARATUS FOR MEASURING ELECTRICAL CHARACTERISTICS OF A SPECIMEN IN WHICH TESTING ELECTRODES ARE AUTOMATICALLY LOWERED RAPIDLY AND THEN SLOWLY INTO CONTACT WITH THE SPECIMEN**

**Joseph Y. Chan, Chelmsford, and Dinesh C. Gupta, Cambridge, both of Mass., assignors to GTE Laboratories Incorporated**

**Filed Dec. 22, 1969, Ser. No. 886,908**
**Int. Cl. G01r 31/26**
**U.S. Cl. 324—158 P** **7 Claims**

Apparatus for bringing testing electrodes into contact with a specimen with a uniform, consistent, reproducible force of impact. The apparatus lowers the electrodes rapidly during a first portion of their downward movement and then, when the electrodes have reached a predetermined position, at a slow speed. The change of speed occurs at the same precisely controlled predetermined position each time the electrodes are lowered. After the electrodes have come into contact with the specimen and have reached a predetermined lowered position, the downward motion is stopped abruptly. Stopping of the downward movement occurs at the same precisely controlled predetermined lowered position each time the electrodes are lowered.



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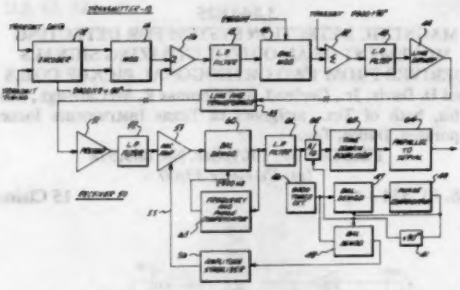
**3,644,830**

**DATA MODEM HAVING PHASE, FREQUENCY AND AMPLITUDE DISTORTION COMPENSATING MEANS**

**Robert Gordon Ragsdale, Hollywood, Fla., assignor to Milgo Electronic Corporation, Miami, Fla.**

**Filed Nov. 18, 1969, Ser. No. 877,813**
**Int. Cl. H04b 1/12**
**U.S. Cl. 325—42** **11 Claims**



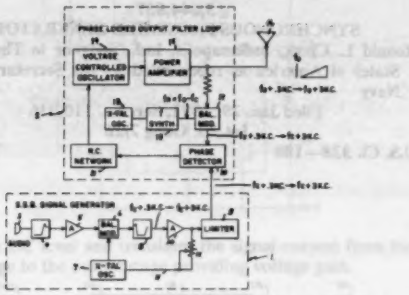
A high-speed data modem utilizing a two-level, two-polarity data format is disclosed. Digital data is grouped into bit pairs, one bit of each pair is assigned one of two polarities and the other bit is assigned one of two amplitude levels. The bit pairs are modulated with a pair of pilot tones for transmission over a telephone line utilizing a 2,400-cycle-per-second bandwidth.

DC noise factors introduced by the telephone line and circuitry are compensated for by deriving from the received signal DC noise associated with frequency and phase variations between the transmitted and received pilot tones. The DC noise from these tones is converted into digital signals. The digital signals are applied to add and subtract circuitry of a divider chain such that phase and frequency translation of the derived tones, due to telephone line disturbances, are compensated for by emitting pilot tones from the divider which cancel out the DC noise.

## 3,644,831
## MODULATION SYSTEM

Alex Latker, and Johannes J. Vandegraaf, both of Lynchburg, Va., assignors to General Electric Company

Continuation of application Ser. No. 423,093, Jan. 4, 1965, now abandoned. This application Oct. 9, 1967, Ser. No. 685,222
Int. Cl. H04b 1/68, 1/04
U.S. Cl. 325—137 4 Claims

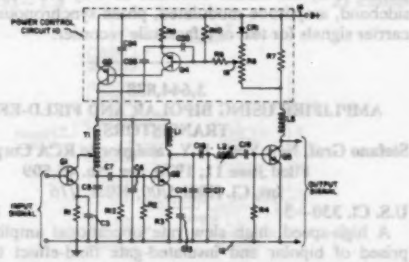



A narrow band transmitter utilizing a modulation technique in which a variable frequency oscillator is constrained to follow the frequency variations of a heavily limited single sideband signal to produce a constant-amplitude, narrow band output signal. The audio intelligence is applied to a single sideband modulator to produce a single sideband signal, which is then heavily limited to remove the amplitude information, with the intelligence being retained in the zero crossings of the limited signal. The limited S.S.B. signal controls a phase-locked oscillator loop, which varies the frequency of a variable frequency oscillator, forcing it to follow the frequency variation of the limited single sideband signal. The output from the phase-locked loop is a constant-amplitude, narrow band signal, the frequency excursion of which is substantially the same as the frequency excursion of the audio intelligence. The phase-locked loop may include frequency multiplication stages and Class-C amplifiers for processing the output signal from the oscillator to permit maximum efficiency in operation, since no amplitude information is being transmitted.

## 3,644,832
## POWER CONTROL CIRCUIT

Ralph R. Sherman, Jr., Forest, Va., assignor to General Electric Company

Filed Sept. 28, 1970, Ser. No. 76,374
Int. Cl. H04b 1/04; H02h 7/20; H03g 3/30
U.S. Cl. 325—186 3 Claims

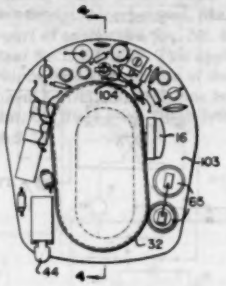



The output power produced by a radio transmitter is maintained at a more nearly constant level by a control circuit that senses the current supplied to the output stage of the transmitter, and that supplies current to a preceding driver stage of the transmitter as an inverse function of the output current.

## 3,644,833
## EAR-SUPPORTED RADIO RECEIVER

Frank H. McIntosh, Chevy Chase, Md., assignor to Lectour Communications Corporation, New York, N.Y.

Filed July 12, 1966, Ser. No. 564,666
Int. Cl. H04b 1/08
U.S. Cl. 325—361 1 Claim

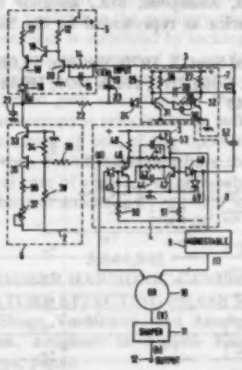



A radio receiver including a printed circuit board having an oval cutout which fits over the human ear and is supported by the ear in listening position.

## 3,644,834
## FREQUENCY DIVIDER CIRCUITS

John Harry Taylor, Cheddar, Somerset, and Roger Stephen Harris, Wells, Somerset, both of England, assignors to Electric & Musical Industries Limited, Hayes, Middlesex, England

Filed Mar. 27, 1970, Ser. No. 23,341
Claims priority, application Great Britain, Mar. 29, 1969, 16,577/69
Int. Cl. H03k 25/06
U.S. Cl. 328—46 7 Claims



A frequency divider circuit for producing an output signal from an input signal of periodicity $t$ is provided, including means for deriving an intermediate signal which defines alternate intervals $N \cdot t$ and $M \cdot t$., where N and M are integers, means for extending the ends of alternate intervals by $P \cdot t/2$., where P is an odd integer, so as to produce a further inter-

mediate signal, and means for generating said output signal in response to said further intermediate signal. Such a frequency divider circuit is disclosed which is adapted for providing field synchronizing pulses from line frequency pulses.

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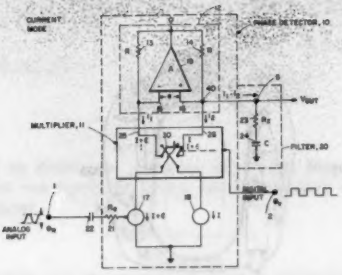
**3,644,835**
**PHASE DETECTOR AND DIGITAL PHASE-LOCKED LOOP**

**James E. Thompson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Dec. 21, 1970, Ser. No. 99,764**
**Int. Cl. H03d *13/00***
**U.S. Cl. 328—133** **13 Claims**



There is disclosed a phase detector which operates in a current mode to detect the phase difference between an analog input signal and a digital input signal. The phase difference between these two signals is provided as a current generated from combined chopping and gain block circuits. Current-mode operation increases the gain obtainable from prior art voltage-mode phase detectors and enables convenient filter circuit design for integration of the output signals from the phase detector. The current-mode phase detector may be used in combination with a voltage-controlled multivibrator circuit to provide a digital phase-locked loop having a high-loop gain and having improved pull-in and hold-in ranges. The combined chopping and gain block circuits enables IC implementation with a minimum number of external connections.

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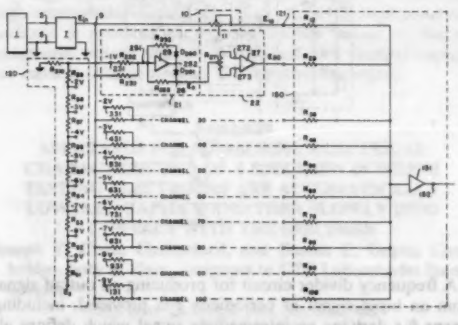
**3,644,836**
**NONLINEAR COMPENSATION NETWORK**

**Roy D. Johnson, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Sept. 2, 1970, Ser. No. 69,085**
**Int. Cl. G06g *7/12*; H03k *5/00*; H03b *1/00***
**U.S. Cl. 328—143** **10 Claims**



A compensation network having as an input a nonlinear transducer generated signal, which produces a linear signal by balancing out the nonlinearities in the transduced signal. Compensation is achieved by a plurality of individually operated slope circuits. Each slope circuit is actuated at a particular break point or voltage level of the sensor signal. When actuated the slope circuit produces a signal which compensates for the nonlinearity. The compensator includes break point circuits actuating each slope circuit at the predetermined break point voltage and the break point circuits are closed-loop design minimizing amplifier instability and temperature shift.

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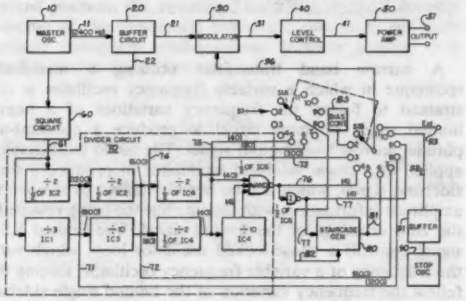
**3,644,837**
**SYNCHRONOUS FACSIMILE GENERATOR**

**Ronald L. Clark, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Jan. 29, 1971, Ser. No. 110,916**
**Int. Cl. G06g *7/28***
**U.S. Cl. 328—188** **7 Claims**



A synchronous facsimile generator having a master tuning fork oscillator coupled through a squaring circuit to produce square wave oscillations that are applied to integrated division and NAND circuits to produce a plurality of different combinations of frequency and wave patterns to provide a plurality of different functions applicable to test a facsimile recorder of carrier, start, phase, gray scale, and stop, with an additional tap input for other desired test signals, each frequency and wave pattern function being applied through a selector switch to a modulator to modulate the carrier produced by the master oscillator thereby producing double sideband, amplitude modulated, phase synchronous with the carrier signals for test of a facsimile recorder.

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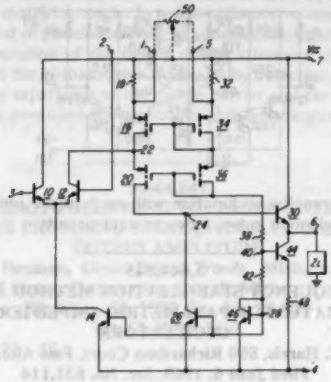
**3,644,838**
**AMPLIFIER USING BIPOLAR AND FIELD-EFFECT TRANSISTORS**

**Stefano Graf, New York, N.Y., assignor to RCA Corporation**

**Filed June 11, 1970, Ser. No. 45,509**
**Int. Cl. H02f *5/00*; H03f *3/16***
**U.S. Cl. 330—3** **12 Claims**

A high-speed, high slew rate operational amplifier comprised of bipolar and insulated-gate field-effect transistors (IGFET's). The amplifier includes a bipolar differential input stage whose active load is the source-drain path of a first IGFET. The source-drain path of a second IGFET is connected between the output node of the differential input stage and

the input of the emitter follower output stage. The second IGFET operated in the common-gate configuration level



shifts the DC level and translates the signal current from the input stage to the output stage providing voltage gain.

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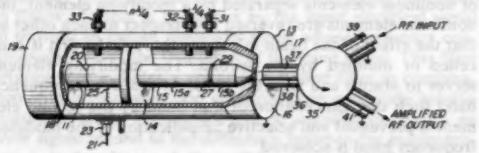
**3,644,839**

## TRANSFERRED ELECTRON AMPLIFIER

**Barry Stuart Perlman, Hightstown, and Thomas Edward Walsh, Kearny, both of N.J., assignors to RCA Corporation**

**Filed Dec. 29, 1969, Ser. No. 888,477**
**Int. Cl. H03f** *3/04*
**U.S. Cl. 330—5** **9 Claims**




A transferred electron amplifier characterized by the uncompensated bulk-type material in the active region having an $nL$ product larger than about $5\times10^{11}$ cm.$^{-2}$ is described where $n$ is the carrier density and L is the length of the material between terminals. The amplifier provides high power, signal amplification at microwave frequencies near the transit-time frequency.

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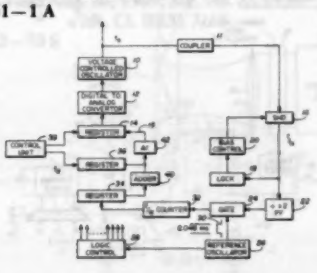
**3,644,840**

## VARIABLE FREQUENCY CONTROL

**David C. Conner, Dallas, Tex., assignor to LTV Electrosystems, Inc., Greenville, Tex.**

**Filed May 28, 1970, Ser. No. 41,246**
**Int. Cl. H03b** *3/04*
**U.S. Cl. 331—1 A** **21 Claims**



A variable frequency oscillator is digitally commanded to any one of a large number of frequencies by a system that involves closing a sample data frequency servomechanism loop around a voltage (or current) controlled oscillator. In the sample data frequency loop, a phase-locked subharmonic oscillator produces a sampled frequency at a fraction of the oscillator output. This sampled frequency is applied to a logic system that produces a frequency error signal by an arithmetic operation of subtraction and addition. This frequency error signal is then utilized to adjust the controllable oscillator.

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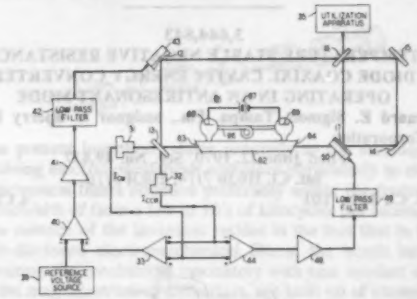
**3,644,841**

## FREQUENCY-STABILIZED SINGLE MODE RING LASERS

**Peter William Smith, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of application Ser. No. 656,519, July 27, 1967, now Patent No. 3,537,027. This application May 4, 1970, Ser. No. 34,440. The portion of the term of this patent subsequent to Oct. 27, 1987, has been disclaimed.**
**Int. Cl. H01s** *3/00;* **G01b** *9/02*
**U.S. Cl. 331—94.5** **6 Claims**




A sensitive frequency discriminant based on the gain profile of the active medium can be obtained in an ion ring laser having a Doppler-broadened emission line by promoting stable competition between oppositely propagating traveling-wave components of a single transverse mode and by tuning an auxiliary ring resonator that determines the frequency of the primary ring resonator to maintain substantially equal intensities of the oppositely propagating waves. The discriminant is then used to stabilize the auxiliary ring resonator. The primary ring resonator is stabilized by locking one of its resonant frequencies to a resonance of the auxiliary ring resonator with a feedback circuit. Stable competition is achieved by providing a selected gain anisotropy of the ion laser active medium. The anisotropy is selected to be sufficiently large to inhibit the quenching of one of the oppositely propagating waves by the other, even though they have the same frequency. In the typical case of a gas ion laser, a substantial ion drift rate provides the gain anisotropy.

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**3,644,842**

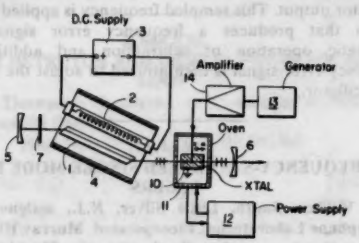
## OPTICAL HIGHER HARMONIC GENERATOR WITH TEMPERATURE EFFECTING PHASE MATCHING

**Teiji Uchida; Shogo Yoshikawa, and Atsufumi Ueki, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed July 22, 1969, Ser. No. 843,564**
**Claims priority, application Japan, July 23, 1968, 43/52375**
**Int. Cl. H01s** *3/00*
**U.S. Cl. 331—94.5** **2 Claims**

An optical higher harmonic generator includes a laser material, an excitation source for producing the population inversion in the laser material, and two reflectors constituting an optical resonator sandwiching the laser material

therebetween. A crystal piece having the electro-optical effect and nonlinear optical effect is disposed within the




resonator and a signal source applies to the crystal piece a signal having the modulation frequency and voltage necessary for locking the oscillation modes of the laser.

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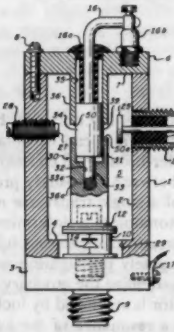
**3,644,843**

**TEMPERATURE STABLE NEGATIVE RESISTANCE DIODE COAXIAL CAVITY ENERGY CONVERTER OPERATING IN AN ANTIRESONANT MODE**

**Bernard E. Sigmon, Tampa, Fla., assignor to Sperry Rand Corporation**

**Filed June 22, 1970, Ser. No. 49,437**
**Int. Cl. H03b 7/14; H03f 3/10**
**U.S. Cl. 331—101** **4 Claims**



A semiconductor diode coaxial line energy converter operable as a single port, high-frequency amplifier or oscillator has enhanced temperature stability and operating power output level through employment of a coaxial cavity resonator structure working in an antiresonant mode and having means for increasing the effective junction capacitance of the active diode.

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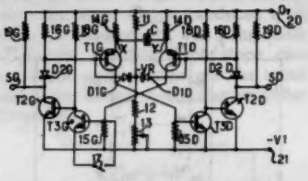
**3,644,844**

**MULTIVIBRATOR CIRCUITS**

**Atanasije Bankovic, Belfort, France, assignor to Societe Industrielle Honeywell Bull, Paris, France**

**Filed Jan. 29, 1970, Ser. No. 6,682**
**Claims priority, application France, Jan. 31, 1969, 6902.009**
**Int. Cl. H03k 3/282**
**U.S. Cl. 331—113 R** **10 Claims**

A transistorized multivibrator for furnishing output pulses having steep edges which are independent of the duration of the pulses, wherein each of a pair of branches comprises two interconnected transistors of opposite conductivity type and a resistor, and wherein a single capacitor is coupled between



the two branches to function with each of the resistors as a common element in two time-constant circuits.

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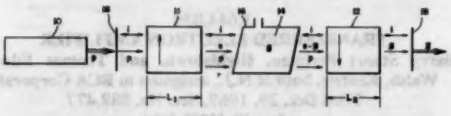
**3,644,845**

**FREQUENCY STABILIZATION METHOD AND APPARATUS FOR PARAMETRIC AMPLIFIERS AND OSCILLATORS**

**Stephen E. Harris, 880 Richardson Court, Palo Alto, Calif.**

**Filed June 6, 1969, Ser. No. 831,114**
**Int. Cl. H03f 7/00**
**U.S. Cl. 331—175** **8 Claims**



A coherent radiation beam passes in series through a pair of nonlinear elements separated by a modifying element, the nonlinear elements are reversed with respect to each other so that the effect of the beam in passing through the first is cancelled or nullified by the second. The modifying element serves to absorb and shift the phase of a selected frequency band such that cancellation of that band by the second element is prevented and selective amplification of the modified frequency band is achieved.

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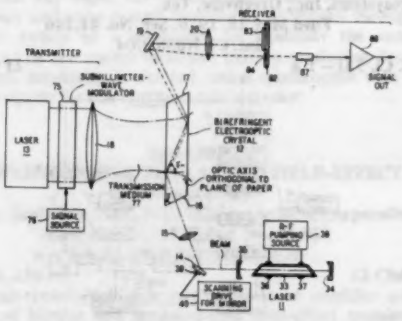
**3,644,846**

**OPTICAL MODULATION BY SUBMILLIMETER-WAVE SIGNALS AND APPLICATIONS THEREOF**

**Thomas James Bridges, Holmdel; Ivan Paul Kaminow, New Shrewsbury, and Martin Alan Pollack, Colts Neck, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed May 4, 1970, Ser. No. 34,198**
**Int. Cl. H01s 3/10**
**U.S. Cl. 332—7.51** **6 Claims**




A continuous-wave cyanide (HCN) laser has been employed to drive a continuous, traveling-wave lithium niobate ($LiNbO_3$) electro-optic modulator at signal frequencies of

964 gHz. (311 μm.) and at 891 gHz. (337 μm.). Part of the power of a visible 0.633-μm. carrier beam is converted into two visible sidebands, one of which is favored by the choice of phase-matching angle. In a submillimeter communication system and in power metering of submillimeter radiation, angular separation of the beams makes attractive the up-conversion to the visible region, followed by detection. The large frequency separation of the visible carrier and the sidebands facilitates precision spectroscopic and metrological applications.

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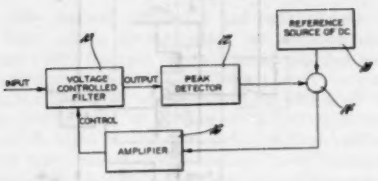
**3,644,847**

**FREQUENCY-FOLLOWING VOLTAGE-CONTROLLED FILTER PROVIDING SUBSTANTIALLY CONSTANT OUTPUT AMPLITUDE**

**John G. Neuman, Gross Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 30, 1970, Ser. No. 93,583**
**Int. Cl. H03h 7/10**
**U.S. Cl. 333—17** **4 Claims**




A filter arrangement for extracting the fundamental frequency from an input periodic electrical signal controlled to follow changes in frequency by the input electrical signal to provide an output sinusoidal signal whose frequency continuously follows the frequency of the input signal. This filter arrangement includes a voltage-controlled filter in combination with a feedback loop comprising an amplitude sensing circuit, a voltage comparator and an amplifier to provide an error signal related to the difference between the instantaneous output voltage of the voltage-controlled filter and a reference voltage. This error signal is applied to the voltage-controlled filter to modify its characteristic response and, accordingly, to enable the voltage-controlled filter to extract a fundamental frequency sinusoid which follows frequency changes by the input signal. Additionally, the instant filter arrangement inherently adjusts for variations in the amplitude of the input signal to effect automatic gain control providing a substantially constant amplitude output voltage.

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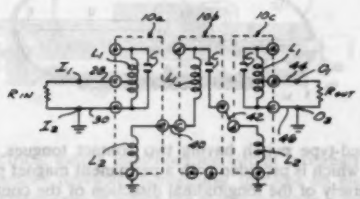
**3,644,848**

**FREQUENCY SELECTING MODULAR COMPONENT AND ASSEMBLY FORMED THEREFROM**

**Chester R. Kruczek, Riverdale, N.J., assignor to General Instrument Corporation, Newark, N.J.**

**Filed Aug. 26, 1969, Ser. No. 853,132**
**Int. Cl. H03h 7/10**
**U.S. Cl. 333—70 S** **20 Claims**



A frequency-selecting assembly is formed from a plurality of substantially similar tunable modular components mounted on an insulating support plate having an input and an output terminal. Each component comprises an L.C. resonant circuit and a plurality of terminals extending therefrom. Means are provided on the support plate to electrically connect selected terminals of a first module to the assembly input terminal and to a selected terminal on a second module, to connect selected terminals on succeeding modules to one another, and to connect a selected terminal of the last module to the assembly output terminal. The assembly input and output terminals extend from the support plate in a direction different from that of the tunable modules.

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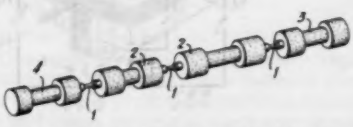
**3,644,849**

**MULTISECTION ELECTROMECHANICAL BANDPASS FILTER**

**Alla Nikolaevna Kalyaeva, prosp. Toreza, 102, korp. 5, kv. 177, and Dmitry Vasilievich Pletnev, ul. Komsomola, 10, kv. 26, both of Leningrad, U.S.S.R.**

**Filed June 26, 1969, Ser. No. 836,850**
**Int. Cl. H03h 9/26, 9/28**
**U.S. Cl. 333—71** **1 Claim**



The present invention relates generally to the techniques of filtering electric oscillations and more particularly to electromechanical filters effective preferably within the frequency bandwidth of from a few to 10's of kilocycles per second.

The essence of the invention resides in the fact that in the herein-disclosed electromechanical filters, the bonds interconnecting the mechanical resonators with one another and with the magnetostrictive converters, are built up of elements dumbbell-like in shape. Such an engineering solution allows the provision of highly reliable, small-sized narrow-band electromechanical filters suitable for operation within the frequency range of from a few to hundreds of kilocycles per second.

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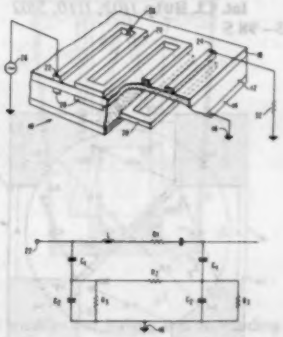
**3,644,850**

**INTEGRATED CIRCUIT BAND PASS FILTER**

**Irving T. Ho, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed June 11, 1969, Ser. No. 832,303**
**Int. Cl. H01p 3/08; H01s 19/00**
**U.S. Cl. 333—73** **2 Claims**



A semiconductor band pass filter is disclosed. The filter is an integrated circuit device having a semiconductor layer with a ground plane on one face and an insulating layer and an overlying conductive line on the other face. The semicon-

ductor layer includes near the insulating layer a highly doped region which may have substantially the same pattern as the conductive line. The passed band can be selected by varying the doping level of the doped region.

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**3,644,851**

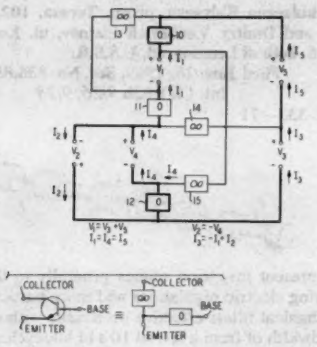
**FIVE-PORT GYRATOR CIRCUIT WHEREIN GYRATOR ACTION IS PRODUCED BETWEEN TWO NONTERMINATED PORTS**

**Richard W. Daniels, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed May 2, 1969, Ser. No. 821,359**

**Int. Cl. H03h 7/44**

**U.S. Cl. 333—80 R** **10 Claims**




A class of gyrator circuits is disclosed which is defined by a set of four matrix equations through the use of a five-port network analysis. The identifying characteristics of this class are that each circuit contains three resistors which form terminations of three of the ports in the five-port network and that gyrator action is produced between the remaining two ports only when the resistances of two of the resistors are tuned to be substantially equal. Because of this tuning ability high-quality gyrator networks may be simulated.

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**3,644,852**

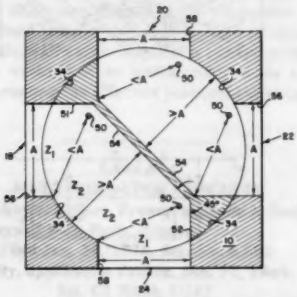
**IMPEDANCE COMPENSATED SWITCH FOR A RECTANGULAR WAVEGUIDE**

**Thomas K. Albee, Western Springs, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.**

**Filed Apr. 25, 1969, Ser. No. 836,680**

**Int. Cl. H01p 1/02, 1/10, 5/02**

**U.S. Cl. 333—98 S** **14 Claims**



Apparatus for selectively switching electromagnetic wave energy from one hollow pipe waveguide to one of two similar waveguides disposed at an angle thereto, the apparatus providing a double-mitered, H plane compensated waveguide bend in which the effective width of the waveguide in the plane of the bend is narrowed at the mitered corners and increased on a line bisecting the angle of the bend to provide a low VSWR over a wide bandwidth for both signal paths.

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**3,644,853**

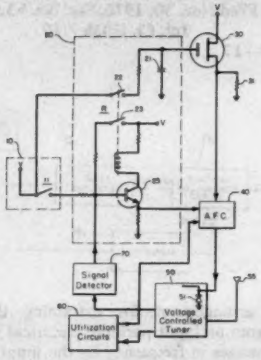
**VOLTAGE-CONTROLLED SIGNAL-SEEKING TUNING SYSTEM**

**John Y. Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed Nov. 23, 1970, Ser. No. 91,894**

**Int. Cl. H03j 3/18; H04b 1/32**

**U.S. Cl. 334—15** **3 Claims**




A signal-seeking tuning system for a receiver having a voltage-controlled tuner wherein a switching circuit, a low-leakage storage capacitor, and a metal oxide field-effect transistor are provided for applying a DC control voltage to the tuner and maintaining the applied voltage at the value corresponding to the selected signal so that the receiver remains tuned to the selected frequency irrespective of temporary loss of signal or receiver deenergization.

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**3,644,854**

**REED SWITCH**

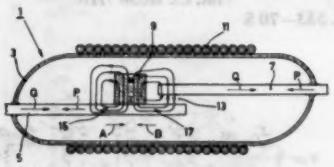
**Jan Paul Steenmeijer, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 20, 1970, Ser. No. 29,888**

**Claims priority, application Netherlands, May 9, 1969, 6907099**

**Int. Cl. H01h 1/66**

**U.S. Cl. 335—153** **4 Claims**



A reed-type switch having two contact tongues, at least one of which is provided with a permanent magnet polarized transversely of the longitudinal direction of the contact tongues and parallel to the direction of movement thereof. By said permanent magnet the adjoining part of the contact tongue concerned is magnetically saturated by a flux passing

consecutively through the contact tongues and produced by external means. The direction of said flux at the contact area is opposite that of the flux of the permanent magnet. The value of said flux is such that the difference between the two fluxes is capable of moving the contact tongues from the open state into the closed state. When the contact tongues are closed, the magnet will maintain the closed condition.

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**3,644,855**

## KEYBOARD REED SWITCH

Walter L. Cherry, and Raymond G. Castle, both of Highland Park, Ill., assignors to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed July 10, 1970, Ser. No. 53,887
Int. Cl. H01h 5/02, 1/66, 3/12
U.S. Cl. 335—205 8 Claims

A pushbutton keyboard switch embodying an enclosed reed contact element mounted on a base portion of a switch in close proximity to a permanent magnet that is movably supported between a pair of opposing spring members, a slidable actuator being in contact with one of the spring members so as to compress the same against the magnet to increase its kinetic force until it overcomes the resistance of the opposing spring to effect longitudinal switching movement of the magnet relative to the reed contact element and to create a tactile feel in the movement of the actuator.

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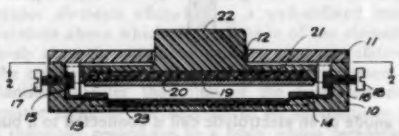
**3,644,856**

## ELECTRICAL SWITCH

John M. Scott, 77 Rutledge Drive, Youngstown, Ohio

Filed Mar. 8, 1971, Ser. No. 121,725
Int. Cl. H01h 5/02
U.S. Cl. 335—207 4 Claims




An electrical switch incorporating circuit terminals and a switch member movable thereagainst to close an electrical circuit therebetween in which the switch member is mounted on a permanent magnet positioned in the electrical switch in opposed polarity with respect to a second permanent magnet whereby the repelling action of the permanent magnets will normally hold the switch member in spaced relation to the circuit terminals.

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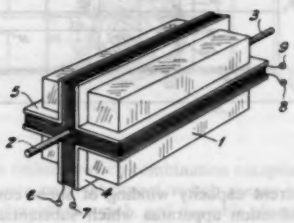
**3,644,857**

## PROCESS AND APPARATUS FOR THE ORIENTATION OF THE STABLE DIRECTION OF MAGNETIZATION OF A MAGNETIC LAYER CARRIED BY A CYLINDRICAL SUPPORT

Rene Fernand Victor Girard, Grenobel, and Jacques Le Guillerm, Avrille, both of France, assignors to Societe Industrielle Honeywell Bull, Paris, France

Filed Apr. 21, 1970, Ser. No. 30,479
Claims priority, application France, Apr. 25, 1969, 6913136
Int. Cl. H01f 1/00
U.S. Cl. 335—209 9 Claims




A process and corresponding apparatus providing for obtaining circumferential orientation of the stable axis of magnetization in a magnetic layer during deposition of the layer on a cylindrical support. This arrangement includes flat windings positioned in parallel to the support and being traversed by polyphase currents and furnishing magnetic field orthozonal to the axis of the support and rotating around the same.

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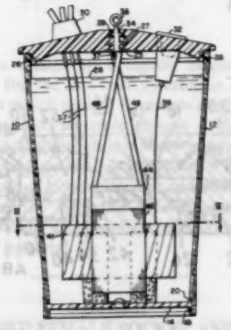
**3,644,858**

## TRANSFORMER HAVING A NONMETALLIC CASING

Dudley L. Galloway, Sharpsville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1970, Ser. No. 75,915
Int. Cl. H01f 27/02
U.S. Cl. 336—92 8 Claims

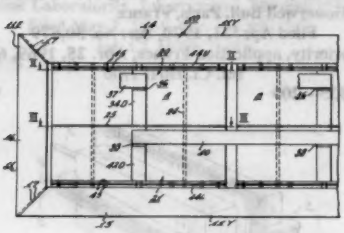


An electrical transformer having a core-winding assembly, with the core-winding assembly and all other metallic parts of the transformer totally enclosed within a nonmetallic casing. The core-winding assembly is supported in the nonmetallic casing from the top cover of the casing. The nonmetallic casing comprises a nonmetallic bottom which is keyed into the sidewalls of the nonmetallic casing to provide a fluidtight joint.

## 3,644,859
## ELECTRICAL WINDING OF SHEET CONDUCTOR

Michael W. Waterman, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 17, 1970, Ser. No. 64,472
Int. Cl. H01f 27/28
U.S. Cl. 336—187 2 Claims

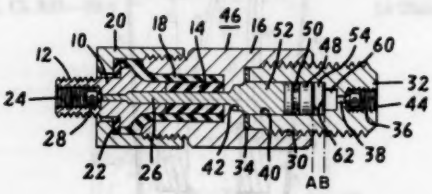


A high-current capacity winding of sheet conductor for stationary induction apparatus which substantially reduces eddy current and circulating current losses has a plurality of coaxial coils each of which is spirally wound from a plurality of conductor sheets in parallel that extend the entire coil height with insulation between paralleled sheets and between spiral turns. Crossover connector strips extending parallel to the winding axis connect paralleled conductor sheets in the plurality of coils in series relation and so that the innermost and outermost of the paralleled conductor sheets of different coils are transposed and the net flux linkages of the plurality of flux paths are approximately equal.

## 3,644,860
## SELF-RESTORING CURRENT LIMITER

Kiyoshi Yamagata; Kiyoshi Matsuura, both of Fukuyama; Toshio Ito; Toshio Miyamoto, and Yuichi Wada, all of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1970, Ser. No. 31,301
Claims priority, application Japan, Apr. 24, 1969, 44/31641; 44/31642; 44/31643; 44/31644
U.S. Cl. 337—21 6 Claims

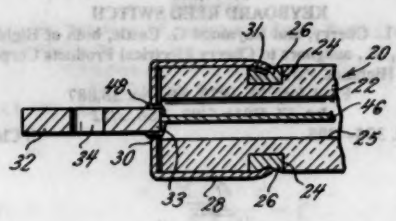



The disclosed current limiters include self-restoring current-limiting material filling one portion of a central hole and a buffer fluid filling the other portion of the hole with a piston slidably fitted filled in the hole to isolate the material from the fluid. Upon the occurrence of short-circuiting current the material evaporates to perform the current limiting operation while a very high pressure due to the evaporated material moves the piston to compress the fluid. Therefore, the pressure is buffed.

## 3,644,861
## PROTECTOR FOR ELECTRIC CIRCUITS

Aloysius J. Fister, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 29, 1970, Ser. No. 59,101
Int. Cl. H01h 85/16
U.S. Cl. 337—252 16 Claims

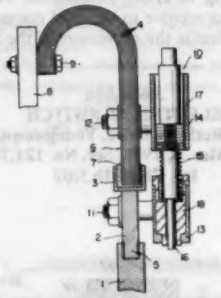



An electric fuse has a ceramic housing with annular grooves adjacent the opposite ends of the outer surface thereof, and has yieldable annuli disposed within those annular grooves. Those yieldable annuli make it possible to "cold-form" the confronting edges, of the cuplike terminals of that electric fuse, into those annular grooves without cracking, pulverizing or fragmenting the endmost edges of those annular grooves. Also, those yieldable annuli coact with those confronting edges to limit the rate at which gases and vapors can escape from that electric fuse.

## 3,644,862
## PROTECTIVE CONNECTION DEVICE IN ELECTRODE WIRING OF ELECTROLYTIC CELLS

Naokichi Otake; Yutaka Yamanobe, both of Iwaki; Katumi Siina, Takahagi, and Kunikatsu Usuba, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 8, 1970, Ser. No. 26,567
Claims priority, application Japan, Apr. 16, 1969, 44/28961
Int. Cl. H01h 37/76
U.S. Cl. 337—408 1 Claim



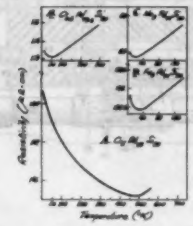
The anode of an electrolytic cell is connected to a bus bar through a connection device in which a lead wire connected at one end to the bus bar is connected at the other end to the anode through a solder joint, on which a continuous separating force is exerted by a spring-separating mechanism. When an excess current due to a short circuit in the electrolytic circuit flows through the lead wire, the solder melts and the joint is broken by the separating mechanism to break the circuit, whereby the electrolytic circuit parts are protected.

3,644,863

## METALLIC RESISTANCE THERMOMETER

Chang-Chyi Tsuei, Pasadena, Calif., assignor to California Institute Research Foundation, Pasadena, Calif.

Filed Apr. 10, 1969, Ser. No. 815,162
Int. Cl. G01k 7/22
U.S. Cl. 338—25 7 Claims



A class of alloys, when converted to amorphous form by quenching from the molten state, is useful for sensing temperature by virtue of a temperature coefficient of electrical resistivity that is negative over a usefully wide range, including the neighborhood of absolute zero. Such alloys comprise three components: a metal of the platinum series, silicon or germanium, and an inner member of the first series of transition metals. A preferred type of composition is $Pd_{80-x}Si_{20}Cr_x$, where $x$ may have any value up to about 8.

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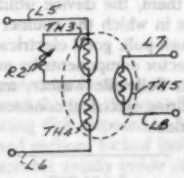
3,644,864

## COMPOSITE THERMISTOR TEMPERATURE SENSOR HAVING STEP-FUNCTION RESPONSE

Hans G. Hirsbrunner, Attleboro, and Lyle E. McBride, Jr., Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 5, 1969, Ser. No. 882,567
Int. Cl. H01c 7/02
U.S. Cl. 338—25 3 Claims



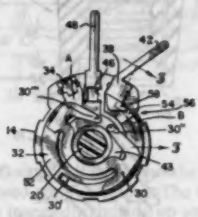

A temperature sensor including first and second PTC thermistor elements each having a well-defined transition temperature above which the resistance of the element rises relatively abruptly and below which it changes relatively little, the transition temperature of the second element being substantially greater than that of the first element. The thermistor elements are adapted to be substantially identically thermally responsive to a body whose temperature is sensed by the sensor. The elements are connected in series-circuit relationship to cause the sensor resistance to be a series-equivalent resistance which varies as a function of the resistance of the elements and changes relatively abruptly at temperatures determined by the transition temperatures of the elements thereby providing the sensor with a step-function R vs. T characteristic.

3,644,865

## COMBINATION VARIABLE RESISTOR AND SWITCHING MEANS

Joseph L. Kirby, Thorntown, and George O. Puerner, Frankfort, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 4, 1970, Ser. No. 86,753
Int. Cl. H01c 9/08
U.S. Cl. 338—173 7 Claims



A variable resistor-switch combination comprising an electrical resistance path, electrical switch means integral with the electrical resistance path, and movable electrical contact means cooperating with the electrical resistance path and the electrical switch means.

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3,644,866

## TIGHTLY BOUND BUNDLE OF FILAMENTS AND METHOD OF PRODUCING SAME

Lawrence R. Deardurff, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Jan. 11, 1971, Ser. No. 105,175
Int. Cl. H01c 3/00
U.S. Cl. 338—214 10 Claims

This invention relates to a tightly bound textile strand product suitable for use as a core element in a jacketed composite product in which coated filaments are held together by helically wrapping two separate strands of filaments around the bundle in opposite directions. More particularly, it relates to an improved high-resistance automotive ignition conductor and a method of producing the conductor wherein the overwrapping strands are glass filaments and the ignition conductor is a bundle of glass filaments coated with electrically conductive material.

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3,644,867

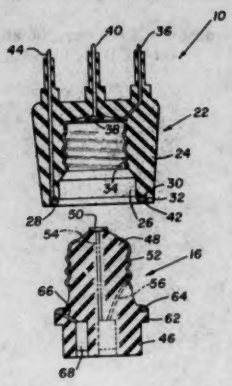
## GROUNDED FEMALE SOCKET AND PLUG

Edward F. Krause, 105 Birs Ave., Lindenhurst, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,673
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 1 Claim

A female socket having a plug-receiving or similar body-receiving opening which terminates in a plug-accommodating seat, and wherein the necessary positive and negative electrical contacts of the same are located about the socket opening while a ground electrical contact is advantageously

located in the plug-accommodating seat. Accordingly, threaded engagement of the plug, lightbulb, or the like within




the socket automatically results in operation of the same with the attendant safety factor of a connection to ground.

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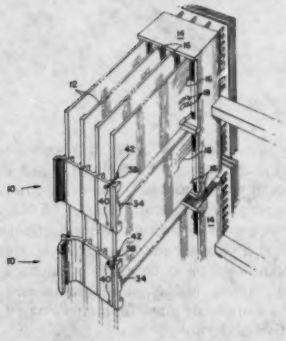
**3,644,868**

## MODULE HOLDER

**David Nevala, Hudson, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Apr. 27, 1970, Ser. No. 31,926**
**Int. Cl. H02b *1/02*; H05k *1/02***
**U.S. Cl. 339—17 LM** **7 Claims**



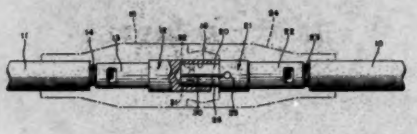

A holder for retaining plug-in printed circuit cards arranged side-by-side in rows or tiers comprises a stiff but resilient strip having spaced-apart grippers projecting out from one face thereof. The grippers are spaced apart a distance equal to the spacing between the cards and each gripper is arranged to grip the edge of a card. Each gripper consists of a pair of spaced-apart fingers which resiliently engage opposite faces of the card. The strip is hinged between the fingers of each gripper so that when the holder is pulled away from the cards, the strip bends backwards, spreading apart the fingers of each gripper so as to release the intervening card.

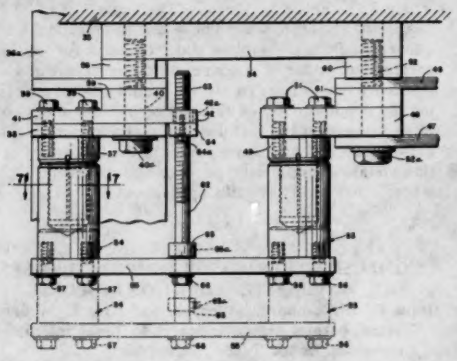
**3,644,869**

## ELECTRICAL COUPLING DEVICE AND ELECTRICAL CONNECTOR

**Albert P. Newman, Springfield Township, Hamilton County, Ohio, assignor to Empire Products, Inc., Cincinnati, Ohio**

**Filed Nov. 3, 1969, Ser. No. 873,248**
**Int. Cl. H01r *31/08*, *11/22***
**U.S. Cl. 339—19** **9 Claims**





An electrical coupling device is provided for bringing various electrical members into electrical connection and also for disconnecting them, the device utilizing electrical connector components in which the manner of connection and disconnection is push-pull, good electrical contact being obtained in the connector components by means of an outward force exerted by a Belleville washer, manipulatable means being provided to bring electrical connector components into and out of engagement.

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**3,644,870**

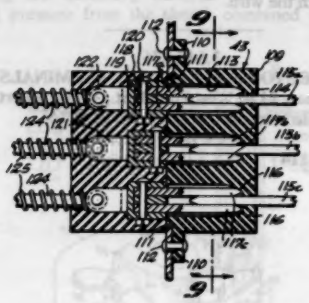
## INTERCONNECTION DEVICE FOR MULTIPLE CONDUCTORS

**Richard D. Jones, 4724 Fairlee Drive, Little Rock, Ark.**

**Original application Oct. 9, 1967, Ser. No. 673,886. Divided and this application Sept. 29, 1969, Ser. No. 870,335**
**Int. Cl. H01r *13/62***
**U.S. Cl. 339—45 M** **1 Claim**

Auxiliary distribution bypass apparatus for use in association with a main electrical power distribution panel, including an auxiliary panel located in spaced relation with respect to the main panel and having distributor circuit plug-in connectors and transfer switches and associated wiring for transferring distributor circuits extending from the main panel to the distributor circuit plug-in connectors, and a portable distribution panel having a main power input and distribution circuits terminating in plug-in-type connector members, and

further including a plurality of patch cable assemblies adapted for selective interconnection between the plug-in



connector members of the portable distribution panel and the auxiliary panel plug-in connectors.

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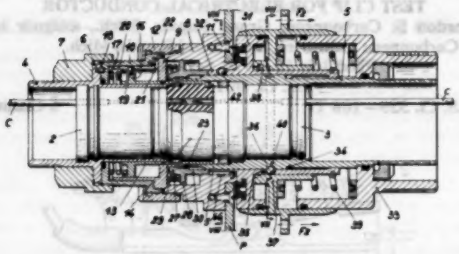
3,644,871

## ELECTRIC CONNECTOR

Maurice Louis Lafont, Paris, France, assignor to Societe Anonyme dite Francelco, Paris, France

Filed Feb. 15, 1968, Ser. No. 705,824
Claims priority, application France, Apr. 14, 1967, 102783
Int. Cl. H01r *13/62*
U.S. Cl. 339—46 2 Claims



The electrical connections between the two sections of the connector are obtained through the use of coupling elements carried by an insulating disk disposed in front of the ends of the cables of the fixed section, locked inside the body of the fixed section, displaceable axially inside of said fixed section and having no electrical contact with said ends of the cables when the two sections of the connector are disconnected.

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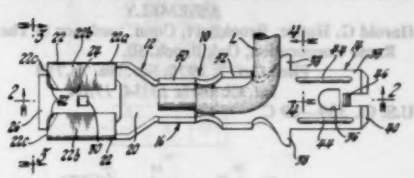
3,644,872

## HERMAPHRODITIC TERMINAL

Andrew Russo, Jr., Fowler, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1970, Ser. No. 82,894
Int. Cl. H01r *13/28*
U.S. Cl. 339—47 R 3 Claims

In a preferred form, this disclosure relates to a hermaphroditic electrical connector comprising a one-piece member made from thin gauge sheet stock having a female terminal at one end portion, a male terminal at its other end portion and an intermediate portion which is adapted to be connected to an electrical lead. The female terminal has a base, a pair of upwardly extending wings at the sides of the base and with the wings having sections which are bent over toward each other to define a slot therebetween and a deflectable tongue integral with the base and which is self-biased into engagement with the bent over sections of the wings. The male terminal comprises a flat blade having upstanding ribs for strengthening same and an upstanding tang. The male terminal is adapted to be connected to a mating female terminal of another connector by inserting the same



between the deflectable tongue and the wings and with the tang being received within the slot. The tang insures that the male terminal is inserted right side up so that the ribs are on the side opposite the tongue and so that a nib on the tongue will be received within an opening in the male terminal to lock the two terminals together.

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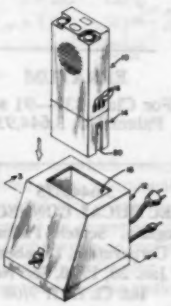
3,644,873

## ELECTRICAL CONNECTOR FOR A RADIO RECEPTACLE

Wayne D. Dalton; Stanley C. Mackzum; Friedrich H. Mann, and Paul F. Sensabaugh, all of Lynchburg, Va., assignors to General Electric Company

Filed Oct. 22, 1970, Ser. No. 83,064
Int. Cl. H01r *13/54*
U.S. Cl. 339—79 4 Claims



An electrical device is provided with a receptacle for receiving a radio. A lever carrying one or more contacts is

pivotally positioned on one wall of the receptacle so that when the radio is inserted in the receptacle, the lever is pivoted and its contacts brought into engagement with contacts on the radio.

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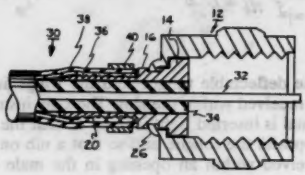
3,644,874
**CONNECTOR ELEMENT AND METHOD FOR ELEMENT ASSEMBLY**
Harold G. Hutter, Brookfield, Conn., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Oct. 7, 1970, Ser. No. 78,718
Int. Cl. H01r *13/54, 17/04*
U.S. Cl. 339—89 C 8 Claims




A connector element and method for its assembly. A ferrule body having an enlarged forward section, a center section of reduced diameter having a circumferential groove formed in it, and an elongated rear section has a coupling nut mounted for rotation on it. The nut has an opening formed in its rear of diameter greater than that of the center section but less than that of the forward section in which the center section of the body is partially positioned. The coupling nut also has a circumferential ridge extending from the opening to the rear of the nut, which ridge is bent over by a suitable tool into the groove to lock the body and nut against lateral movement.

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**ERRATUM**

For Class 339—91 see:
Patent No. 3,644,938

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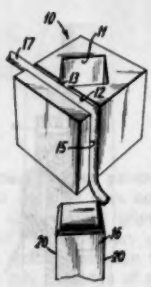
3,644,875
**ELECTRICAL CONNECTOR**
Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Jan. 20, 1970, Ser. No. 4,388
Int. Cl. H01r *9/08*
U.S. Cl. 339—97 R 11 Claims




The connector is formed with a longitudinal bore to receive the rectangular-shaped post as well as with a recess which extends either longitudinally or transversely of the bore. In either embodiment, the bore is in communication with the recess so that at least one of the sharp corners of the post projects into the recess and thus into an insulation coated wire disposed within the recess to form an electrical connection with the wire.

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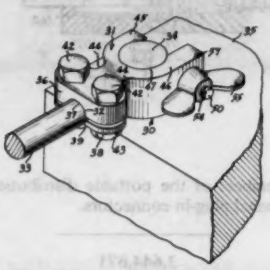
3,644,876
**CONNECTOR FOR BATTERY TERMINALS**
Orrin H. Thomas, 2120 West Fourth St., Williamsport, Pa.
Filed Oct. 8, 1969, Ser. No. 864,745
Int. Cl. H01r *11/26*
U.S. Cl. 339—114 1 Claim




A connector for battery terminals having the means for preventing corrosion, locking or freezing to a battery post, and wherein there is provided a means for permitting the battery terminal connector to be installed or removed by the hand with no tools required.

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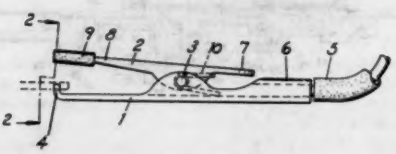
3,644,877
**TEST CLIP FOR ELECTRICAL CONDUCTOR**
Gordon S. Carbonneau, Grand Rapids, Mich., assignor to Carbonneau Industries, Inc., Grand Rapids, Mich.
Filed July 10, 1970, Ser. No. 53,781
Int. Cl. H01r *11/24*
U.S. Cl. 339—108 TP 6 Claims




A test clip having opposed spring closed jaws has one electrically conducting jaw and an opposed jaw with a yieldable and deformable surface capable of conforming to the shape of a wire or terminal to which the clip is attached. The yieldable surface has a high coefficient of friction.

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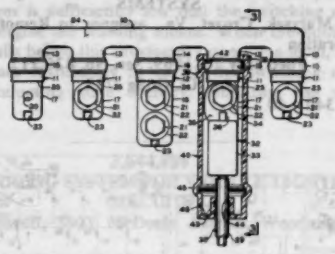
3,644,878
**ELECTRICAL CONNECTOR**
John A. Toedtman, Warson Woods, Mo., assignor to ITT Blackburn Corporation, St. Louis, Mo.
Original application Aug. 17, 1967, Ser. No. 661,318, now Patent No. 3,480,905, dated Nov. 25, 1969. Divided and this application Sept. 11, 1969, Ser. No. 857,136
Int. Cl. H01r *13/50*
U.S. Cl. 339—213 R 10 Claims

The connector includes a terminal having an outer insulating cover and an inner conducting portion and a conductor having an outer insulating cover and a conductor lug detachably connected to the inner conducting portion of the terminal. A resilient waterproof sheath extends between and is in sealing engagement with the insulating covers of both

the terminal and the conductor. Each sheath end includes internal, annular ribs having a smaller diameter than the diameter of the engaged insulating cover material, thus deforming the insulating material into indentations. The resulting pressure from the sheath combined with the heat



environment within the sheath provides a bonded seal between the sheath and the insulation material. The terminal outer insulating cover is formed into a retaining boss which is engageable by one of the internal, annular ribs at the terminal end of the sheath.

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**3,644,879**

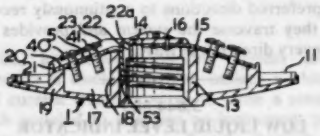
## SNAP-IN CONTACT TERMINAL

**Joseph Frederick Duffield, Georgetown, Ontario, and Zdzislaw R. Godziemba-Dambski, Bolton, Ontario, both of Canada, assignors to Smith & Stone Limited, Toronto, Ontario, Canada, by said Duffield**

**Continuation of application Ser. No. 716,165, Mar. 26, 1968, now abandoned. This application Apr. 6, 1970, Ser. No. 23,094**

**Int. Cl. H01r *9/08***

**U.S. Cl. 339—217 S** **11 Claims**



The invention is directed to a one-piece snap-detent mounted terminal for use in electrical fixtures. A predominant feature of the invention resides in the fact that the disposition of the snap-detent within the fixture augments detent action so that the contact is virtually held substantially irremovable during use. Further, the terminal can be manually assembled into the fixture with the utmost ease. Removal of the terminal, however, requires considerable effort.

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**3,644,880**

## FUSE TERMINAL CONNECTOR

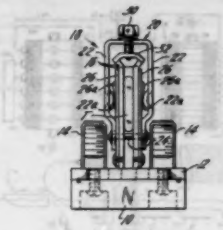
**Arthur J. Worth, Newark, N.J., assignor to Federal Pacific Electric Company, Newark, N.J.**

**Filed Nov. 28, 1969, Ser. No. 880,605**

**Int. Cl. H01r *9/10***

**U.S. Cl. 339—270 F** **9 Claims**

An electrical connector for the blade-type terminal of a fuse has confronting contact plates to receive the blade-type fuse terminal, an inverted U-shaped clamping member pivoted to swing about an axis transverse to the contact plates, cooperating camming parts arranged to squeeze the contact plates against the fuse terminal, and a screw at the



top of the inverted "U" and arranged to bear against the top edges of the contact plates, to operate the camming parts.

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**3,644,881**

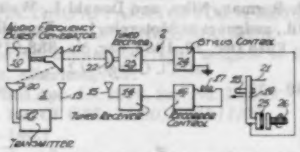
## RECORDER FOR ACOUSTIC RANGING SYSTEM

**Walter Wyslouzil, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada**

**Filed Feb. 9, 1970, Ser. No. 9,702**

**Int. Cl. H04b *11/00***

**U.S. Cl. 340—6 R** **5 Claims**



A sound ranging system in which coincident sound and radio pulses are emitted from a transmitting station. A receiving station is provided with a recorder having a stylus arm released for movement on reception of the radio pulse. A marking pulse is fed to the stylus on reception of the sound pulse, thereby providing an indication of the distance between the transmitting and receiving stations.

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**3,644,882**

## MARINE ACOUSTIC VELOCITY PROFILING

**Kenneth E. Burg, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

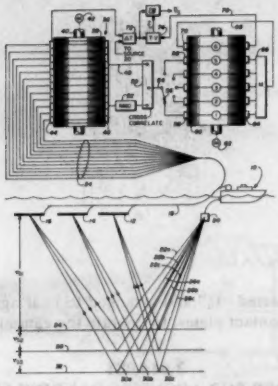
**Filed Aug. 28, 1969, Ser. No. 853,646**

**Int. Cl. G01v *1/28***

**U.S. Cl. 340—7** **6 Claims**

A marine vessel streams a plurality of hydrophones while sequentially generating acoustic waves along a marine traverse at spaced-apart intervals to provide common depth point coverage of reflecting horizons within the water layer. The hydrophones receive reflections from the water layer to generate signals which are then recorded. Cross-correlations are taken of selected gates of the signals, the gates being related to one another in dependence upon the horizontal spacing between ones of the hydrophones. Acoustic velocity is the variable in the cross-correlations. The cross-correlation products are summed to produce a composite velocity correlation function, the peak point of which provides an indication of the acoustic velocity of the underwater section through which the reflections of the acoustic waves travel.

Arithmetic operations are performed on the acoustic velocities to provide a substantially real-time profile of the acoustic



velocity of the intervals between the underwater reflecting horizons.

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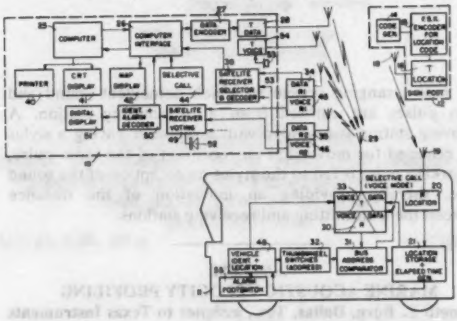
3,644,883

## AUTOMATIC VEHICLE MONITORING, IDENTIFICATION, LOCATION, ALARM AND VOICE COMMUNICATIONS SYSTEM

William M. Borman, Niles, and Donald L. Walker, Addison, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 29, 1969, Ser. No. 888,519
Int. Cl. G08g 1/12
U.S. Cl. 340—23 19 Claims



In a computer-controlled bus-monitoring system, each of the buses in the system is provided with a two-way radio for communication with the control center on either a voice channel or a data channel. In addition, each bus includes a second receiver for receiving signals from signpost transmitters located along the route, with the signpost information being stored in a temporary storage unit in the bus. The computer continually controls interrogation of all of the buses in the system on a data channel, with the buses automatically replying with the stored signpost location plus the time elapsed since that signpost location was stored in the bus. Deviations from schedule are displayed on a control console at the control center. The bus may be alerted to reply on a voice channel by a special code sent over the data channel with selective calling of the particular bus being provided, and a provision also is made for alerting the control center of an emergency on the bus by automatic data transmission from the bus over the voice channel.

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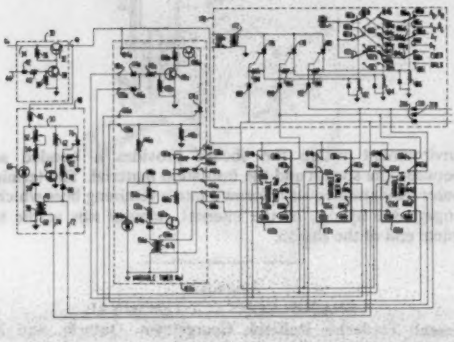
3,644,884

## MODULAR TIMER FOR USE IN TRAFFIC CONTROL SYSTEMS

John J. Matysek, Crozet, Va., assignor to Remote Controls Corporation

Filed May 20, 1969, Ser. No. 826,212
Int. Cl. G08g 1/07
U.S. Cl. 340—40 15 Claims



A cyclic timer and a traffic controller incorporating that timer, and an intersection traffic control system. The timer includes a plurality of timing modules interconnected so that when one module completes the timing of its interval, it turns on the next timing module which, in turn, turns off the module that just completed its interval. The traffic controller further includes a switching unit which accepts inputs from the cyclic timer and in response thereto provides excitation for an intersection right-of-way indicator such as a traffic light. The intersection right-of-way control system permits drivers in preferred directions to continuously receive right-of-way as they traverse the system and provides preferred streets for every direction of travel.

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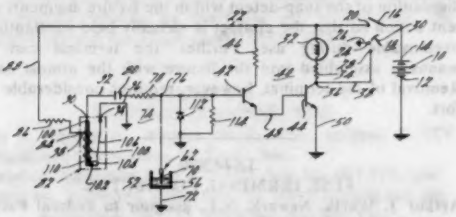
3,644,885

## LOW LIQUID LEVEL INDICATOR

Bernard G. Radin, Oak Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 22, 1970, Ser. No. 48,064
Int. Cl. G01f 23/00
U.S. Cl. 340—59 3 Claims



A low liquid level indicator particularly adapted for use in an automotive vehicle which includes a probe adapted to complete an electrical circuit to the container of the liquid when the liquid is at a satisfactory operating level. A bimetallic pulse-producing means is connected to the source of electrical energy for the vehicle thereby cyclically coupling the source of electrical energy to the probe through an AC

coupling means. A voltage divider is formed by means of a resistor and the impedance of the probe and the container. A solid-state switching network, which controls a warning means, is connected to the junction of the resistance and this impedance. When the liquid is above or equal to the satisfactory operating level, the impedance between the probe and the container is sufficiently low that the switching network will not energize the warning means. When the liquid level, however, falls below this satisfactory operating level, this impedance rises sufficiently to switch the switching network into a conducting state thereby energizing the warning means.

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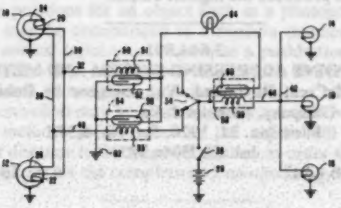
**3,644,886**

## MONITORING SYSTEM FOR VEHICLE LIGHTING CIRCUITS

**Samuel Sabaroff, 5921 McDonie Avenue, Woodland Hills, Calif.**

**Filed Dec. 17, 1969, Ser. No. 885,842**
**Int. Cl. G08b 21/00**
**U.S. Cl. 340—80** **8 Claims**



A failsafe, low-power-monitoring system for vehicle lighting circuits is disclosed which utilizes a characteristic high initial current transient surge to close a sensitive reed relay switch coupled to energize an instrument panel light which indicates when current is flowing through all of the lamp filaments of the lighting circuit being monitored. The energizing coil of the reed relay switch is provided with a predetermined number of turns so that the dropout current is a predetermined amount less than the steady state current of the lighting circuit with all lamps functioning, the failure of one or more of the lamps reducing the current flow to a level below dropout.

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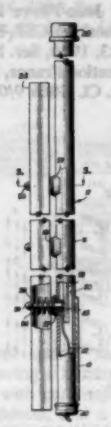
**3,644,887**

## FENDER WARNING DEVICE

**Edward J. Phillips, 1321 Union Avenue, Kansas City, Mo.**

**Filed Nov. 26, 1969, Ser. No. 879,989**
**Int. Cl. B60q 5/00**
**U.S. Cl. 340—102** **4 Claims**

A warning device for a moving vehicle has an upright, electrically conductive tube connected in a series energizing circuit with an alarm, a battery, and a conductive bar shiftably mounted within the tube for movement into and out of engagement with the inner surface thereof. Three studs projecting outwardly from the bar through respective openings in the tube extend outwardly beyond a vulnerable exterior portion of the vehicle and support a shield in spaced relationship to the tube. Engagement of the shield with an obstruction causes the shield and bar to shift in unison with the bar contacting the inner surface of the tube, thereby completing the circuit and actuating the alarm. Resilient mounts within the tube openings support the studs and permit shifting of the bar toward the inner surface in a number of directions.



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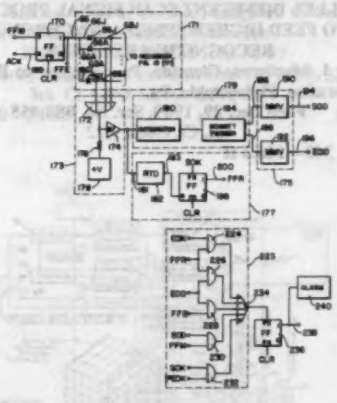
**3,644,888**

## ERROR-DETECTING APPARATUS FOR A KEYSTROKE-OPERATED BUSINESS MACHINE

**Francis C. Marino, Huntington, N.Y., assignor to Digitronics Corporation, Albertson, N.Y.**

**Filed Apr. 13, 1970, Ser. No. 27,689**
**Int. Cl. G08c 25/00; G06f 11/00**
**U.S. Cl. 340—146.1** **19 Claims**



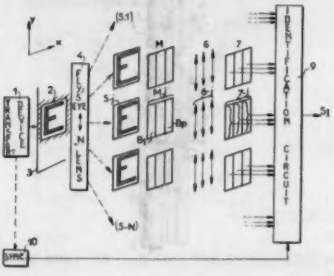
An apparatus which detects errors between the entry of data in a business machine of the type having a plurality of selectively and individually operable information keys movable between a rest and a first commitment level to enter information into the machine and a record of such information. Sensing means senses for discrepancies between machine-entered information and the record and an error-indicating means is energized when a discrepancy is sensed to indicate such error.

## 3,644,889

## SYMBOL RECOGNITION SYSTEM, PARTICULARLY FOR ALPHA-NUMERIC CHARACTERS UTILIZING ELECTRO-OPTICAL TECHNIQUES WITH NONCOHERENT LIGHT

Claude Skenderoff, and Jean-Pierre Bourdu, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 23, 1970, Ser. No. 31,276
Claims priority, application France, May 6, 1969, 14453
Int. Cl. G06k 9/08
U.S. Cl. 340—146.3 G 5 Claims



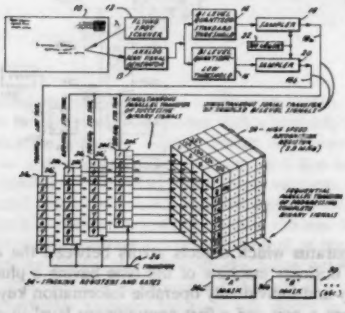
An optical multiplier, such as a fly's eye lens projects a symbol to be recognized on a plurality of masks, which are subdivided into strips, each strip of the mask having predetermined transparencies and transmitting elementary sections of the image to associated photoelectric transducers which are connected to logic circuits identifying those of the transducers associated with any one strip which, conjointly, have an extreme (e.g., maximum) output signal. Preferably, optical or electrical weighting elements are interposed to optimize the outputs of the transducers associated with the various masks.

## 3,644,890

## OPTICAL CHARACTER RECOGNITION SYSTEM USING PARALLEL DIFFERENT SCAN SIGNAL PROCESSORS TO FEED HIGHER SPEED ASYNCHRONOUS RECOGNITION REGISTER

William J. Matthews, Glenside, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Dec. 29, 1969, Ser. No. 888,455
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 H 5 Claims



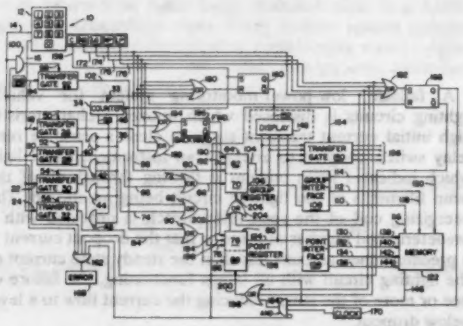
An Optical Character Recognition (OCR) system which scans a character to be recognized to produce a scanner output signal which feeds parallel different processors, the outputs of which are inspected sequentially in real time at a rate higher than the scan signal frequency by a recognition mask system. The parallel different processors derive from the scanner output signal a plurality of different though related output signals which in effect represent a plurality of scans of the character in different modes, thereby reducing the need to rescan nonstandard characters in such different modes. The parallel different processors utilize (1) bilevel quantizers with different threshold levels, thereby to provide a normalized binary signal for characters of nonstandard contrast, and (2) stacking shift registers, operating at different speeds, for receiving the outputs of the bilevel quantizers, thereby to provide a normalized binary signal for characters of nonstandard height. The information in the stacking registers, which store at any instant a part only of the scanner output signal, is periodically supplied, by parallel transmission, to respective groups of nonadjacent initial stages of a high-speed recognition register which operates asynchronously with the scanner and at a much higher speed than the scanner. A set of recognition masks, each designed to provide a maximum output in response to a signal representative of a particular character, is coupled to nonadjacent subsequent stages of the recognition register such that complete binary signals from the stacking register, representing differently processed versions of the scanner output signal, are inspected sequentially. In the course of this operation each mask inspects every binary signal. Identity of the scanned character is indicated by the mask which produces the highest output.

## 3,644,891

## FIELD POINT ADDRESSING SYSTEM AND METHOD

Alan F. McCrea, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 21, 1970, Ser. No. 4,578
Int. Cl. H04q 9/00
U.S. Cl. 340—147 13 Claims



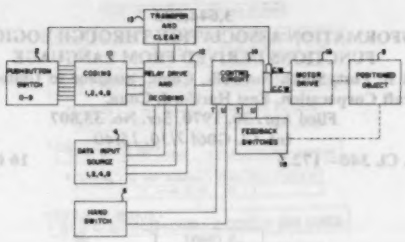
A system and method for addressing a plurality of field points having a group address and a point address including a group register for storing the group address of a selected field point and having counting means included therein for changing the stored group address, a point register for storing the point address of the selected field point and having counting means included therein for changing the stored point address, a field point selection input for entering the group and point addresses for the selected field point, and address changing inputs including an input for changing the stored group address in either a forward or backward manner without changing the stored point address, and an input for changing the stored point address in either a forward or backward manner without changing the stored group address.

3,644,892

## RANDOM SELECTION POSITIONING CONTROL SYSTEM HAVING MULTIDIGIT CONTROL SIGNALS

Oleg Szymber, Elk Grove, Ill., and Frank P. Bennett, Northbrook, both of Ill., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,855
Int. Cl. H04q 3/00, 5/00
U.S. Cl. 340—149 28 Claims




A random selection positioning control is shown in which discrete positions for an object such as a photographic slide carrier may be commanded in a random manner from any one of several input sources such as a pushbutton switch, a rotary switch or a remote data source such as a computer or a telephone transmission system. The position of the object to be controlled may be randomly selected while the control circuit includes means whereby the object will travel the shortest distance to the selected position in order to minimize time required for the completion of an operating cycle.

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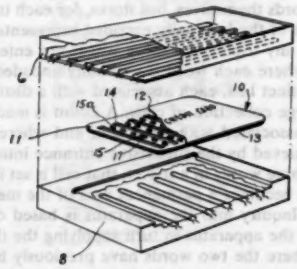
3,644,893

## CREDIT CARD FOR INFORMATION VERIFICATION SYSTEMS

William J. Harwood, 3 Yon Road, Huntington, N.Y.

Filed Aug. 22, 1967, Ser. No. 662,392
Int. Cl. H04q 3/00, 5/00
U.S. Cl. 340—149 2 Claims



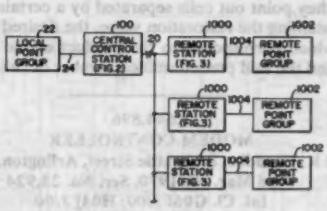

A memory unit comprising a pair of printed circuit boards, each board containing a plurality of loop circuits. The circuits on one board are formed parallel with a given X-axis and the circuits on the other board are parallel with a given Y-axis. The two boards are disposed in close proximity to each other so that their respective circuits effectively intersect and are adapted to receive between them a metallic plate having formed therein rows of holes some of which are connected to apertures by means of slots in the plate according to the encoded information desired. The holes not so connected relative to the slotted holes inhibit voltage induction at the intersections of the X- and Y-loop circuits where the unslotted holes are located.

3,644,894

## SUPERVISORY CONTROL SYSTEM HAVING ALTERNATE SCANNING

Alan F. McCrea, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 24, 1969, Ser. No. 879,403
Int. Cl. H04q 5/00
U.S. Cl. 340—163 20 Claims




A supervisory control system including a plurality of remote stations each having a hundreds address, a group of field points associated with each remote station, each field point having a units address, and a central control station communicating simultaneously with all of the remote stations and generating alarm-scanning signals and control signals in sequential alternation with each signal including a two digit binary coded decimal address such that two alarm scanning or control signals are required to address an individual field point at a remote station whereby alarm scanning and control function operation may be continuously carried out without interference therebetween. The system detects off-normal conditions at the field points by scanning groups until a group having an off-normal condition is detected at which time the individual field points of the group are scanned to locate the field point having the off-normal condition.

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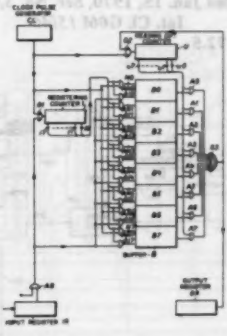
3,644,895

## BUFFER STORE ARRANGEMENT FOR OBTAINING DELAYED ADDRESSING

Goran Anders Henrik Hemdal, Tyreso, and Nils Bertil Lennmarker, Handen, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 5, 1970, Ser. No. 8,937
Claims priority, application Sweden, Feb. 18, 1969, 2240/69
Int. Cl. G06f 13/00; H04q 3/54
U.S. Cl. 340—172.5 1 Claim



A buffer store arrangement in a data controlled telecommunication system for delaying by a predetermined number of periods of a clock frequency the addressing of addresses separated by a restoration value. The arrangement comprises

store cells with registering circuits and restoration circuits in the input side and reading circuits on the output side, a registering counter, a reading counter and a clock pulse generator. Each restoration circuit is connected to the clock pulse generator so that the restoration value is registered before the registering counter is activated. A data processor has an input register, which on its output is connectable to the registering circuits for registering data in a certain cell and to the registering counter for stepping at registering, and an output register. By setting the registering and reading counters so that they point out cells separated by a certain number of cells containing the restoration value, the desired delay is obtained which corresponds to the product of the clock pulse period and the said predetermined number of cells.

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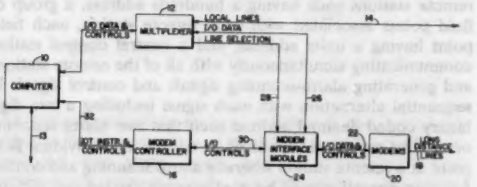
**3,644,896**

## MODEM CONTROLLER

**Ashwani K. Chaddha, 83 Brattle Street, Arlington, Mass.**

**Filed Mar. 30, 1970, Ser. No. 23,924**
**Int. Cl. G06f 3/00; H04j 3/00**
**U.S. Cl. 340—172.5** **14 Claims**




A data system for handling selectively controlling modems for the transfer of data to and from a plurality of remote, asynchronous data station by way of a serial line multiplexer interfacing with a small-scale data processor or computer. The system responds to the presence of a ring on any one of plural input lines to control the associated modem for the assembly of data characters. The system also operates to control a selected modem for the transmission of data characters over an associated output line to a remote data station.

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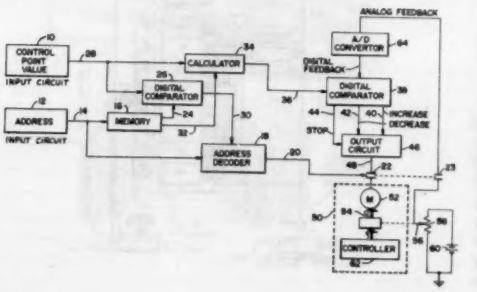
**3,644,897**

## AUTOMATIC CONTROL POINT ADJUSTMENT SYSTEM AND METHOD

**Alan F. McCrea, and Hugh V. Snively, both of Richmond, Va., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed Jan. 15, 1970, Ser. No. 3,005**
**Int. Cl. G06f 15/46**
**U.S. Cl. 340—172.5** **8 Claims**




A system and method for automatically adjusting a control point including input circuits receiving arbitrarily selected control point values in engineering units and addresses of controllers to be adjusted, a memory storing conversion data for the controllers corresponding to a reset range and a curve of positioning of the controllers versus control point values, a calculator receiving the conversion data and the selected control point value for a controller and calculating a required position for the controller to provide the selected control point value, and a comparator receiving the required position and the actual position of the controller and providing output signals to move the controller to the required position.

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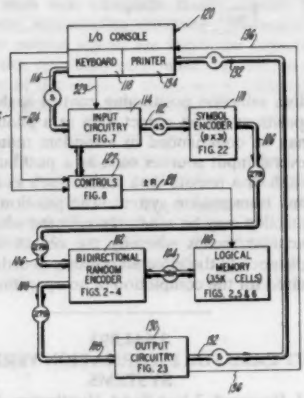
**3,644,898**

## INFORMATION ASSOCIATION THROUGH LOGICAL FUNCTIONS DERIVED FROM LANGUAGE

**Paul B. Post, South Norwalk, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed Apr. 30, 1970, Ser. No. 33,807**
**Int. Cl. G06f 7/30, 15/40**
**U.S. Cl. 340—172.5** **16 Claims**




In a data-processing apparatus of a new type, information consists of a plurality of triplets, each of which is a group of three words in ordinary language, selected on the basis of their mutual semantic relevance. The apparatus does not store the words themselves, but stores, for each triplet, a logical function of the internally encoded representations of the words. For any triplet, the three words are entered into the processor where each word is randomly encoded into a plurality of distinct bits, each associated with a distinct memory cell in a large collection of cells. A count is made by logical apparatus associated with each cell, and where a count of three is achieved by the successive entrance into the processor of the three words in a triplet, that cell is set into a logical 1 state and becomes a permanent part of the memory of the apparatus. Inquiry into the apparatus is based on providing two words, the apparatus in turn supplying the third word in the case where the two words have previously been entered as part of a triplet, as described above. Exemplary data handling and control apparatus is also disclosed.

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**3,644,899**

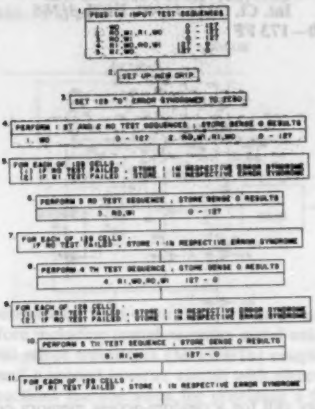
## METHOD FOR DETERMINING PARTIAL MEMORY CHIP CATEGORIES

**Conrad J. Boisvert, Jr., Wappingers Falls, N.Y., assignor to Cogar Corporation, Wappingers Falls, N.Y.**

**Filed July 29, 1970, Ser. No. 59,109**
**Int. Cl. G06f 11/04**
**U.S. Cl. 340—172.5** **19 Claims**

A machine-practiced method for determining partial memory chip categories. In the case of 128-cell chips having seven address bits, there are fourteen partial memory chip

categories; permanently addressing any one of the seven address lines with a 1 or a 0 produces an effective 64-cell chip, any cell of which can be selected depending upon the address bits extended to the other six address lines. Each address bit of each bad cell on the chip is examined. Depending on its



value, one of two respective partial chip categories is eliminated. After all cells have been processed in this manner, the partial chip categories which have not been eliminated are those applicable to the chip.

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**3,644,900**

**DATA-PROCESSING DEVICE**

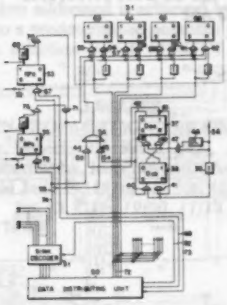
**Tetsuya Mizoguchi, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Dec. 1, 1969, Ser. No. 881,141**

**Claims priority, application Japan, Nov. 30, 1968, 43/87729**

**Int. Cl. G06f *9/20***

**U.S. Cl. 340—172.5** **7 Claims**



In a data-processing device controlled by a high-speed control arithmetic unit the average access time is decreased by preventing the entry into a receiving register of a memory word which has been found unnecessary during the memory access period. In case an advance command is being issued designating one sink code out of a plurality of sink codes assigned to a certain receiving register, when the necessity arises for controlling transfer to another register due to the detection of a branch, interruption, etc., then another sink code is designated, in place of the originally designated sink code, out of the remaining codes within said receiving register without awaiting the termination of the original information readout, and that addressed register to which the control is transferred is read out.

**3,644,901**

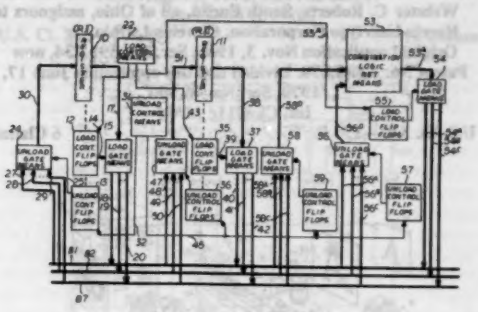
**DIGITAL SYSTEM FOR CONTROLLING SIGNAL TRANSFERS BETWEEN REGISTERS AND DATA BUSES**

**Roy J. Zingg, Ames, Iowa, assignor to Iowa State University, Ames, Iowa**

**Filed July 24, 1969, Ser. No. 844,319**

**Int. Cl. G06f *15/00, 15/56***

**U.S. Cl. 340—172.5** **5 Claims**



The selective transfer of data signals from selected ones of a plurality of storage registers to selected ones of a separate number of data buses is achieved by storing control signals in control registers associated with each of the storage registers. The control signals indicate the data bus to which the signal contents of the storage register associated with that control register are to be transmitted; and gating circuitry responsive to the control register signals couple the signal contents of the registers to the proper data buses. The communication between registers and buses is maintained until the contents of one of the control registers is changed. Thus, a number of registers may communicate with a number of buses simultaneously; and the contents of a bus may be operated on directly. Circuitry is also disclosed for simultaneously coupling the signal contents of data buses to selected registers.

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**3,644,902**

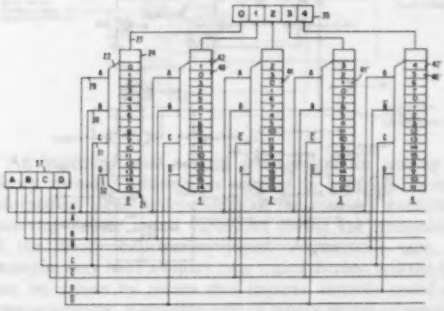
**MEMORY WITH RECONFIGURATION TO AVOID UNCORRECTABLE ERRORS**

**William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 18, 1970, Ser. No. 38,220**

**Int. Cl. G06f *13/00***

**U.S. Cl. 340—173 R** **10 Claims**



A memory having circuits for correcting single errors in a word read from the memory is provided with means to reconfigure the memory so that a configuration having a double,

uncorrectable, error is changed to a configuration having two single, correctable errors. In one embodiment, interchanging plug-in components for two or more bit positions produces a new configuration; in another embodiment, the wiring to the plug-in components is easily changeable.

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3,644,903

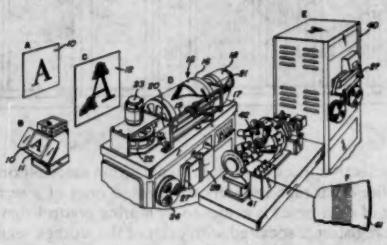
## CODED RECORD METHOD AND APPARATUS

Edwin R. Kolb; John F. Blaha, both of Cleveland, and Webster C. Roberts, South Euclid, all of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Original application Nov. 3, 1966, Ser. No. 591,734, now Patent No. 3,588,870. Divided and this application June 17, 1970, Ser. No. 46,900

Int. Cl. G11c *13/04*

U.S. Cl. 340—173 R 6 Claims



Coded record manufacture and apparatus suitable for storing digital representations of graphical images, such as characters, are disclosed herein for use in subsequent reproduction of the images, as on the face of a cathode-ray tube. Images or characters are scanned to obtain electrical signals indicative of the features thereof and the signals are recorded as digital representations.

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3,644,904

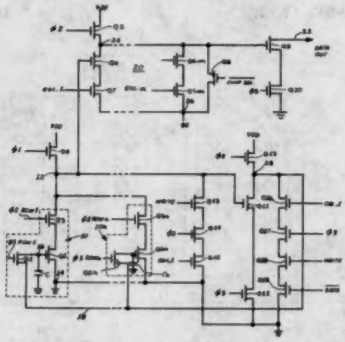
## CHIP SELECT CIRCUIT FOR MULTICHIP RANDOM ACCESS MEMORY

Lamar T. Baker, Hauppage, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Nov. 12, 1969, Ser. No. 875,925

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R 9 Claims



A random access read-write memory comprises memory sections formed on a plurality of chips. The decoding of the chip select signal inhibits the write command signal from all but the selected chip, thereby permitting new data to be written only at the selected chip.

3,644,905

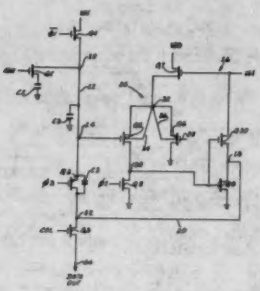
## SINGLE DEVICE STORAGE CELL FOR READ-WRITE MEMORY UTILIZING COMPLEMENTARY FIELD-EFFECT TRANSISTORS

Lamar T. Baker, West Islip, L.I., N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Nov. 12, 1969, Ser. No. 875,968

Int. Cl. G11c *11/40*; H03k *3/286*

U.S. Cl. 340—173 FF 13 Claims



A memory cell for a random-access memory comprises a data storage element at which data is stored at one of two discrete levels. When the memory cell is addressed, a signal corresponding to the stored data signal is developed and is compared to a reference signal at a comparator, thereby to produce an output data signal. The comparator may be formed of two field-effect transistors respectively receiving the data and reference signals at their gates. The sources of these transistors may be connected to the substrate to ensure minimum threshold voltages for these devices.

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3,644,906

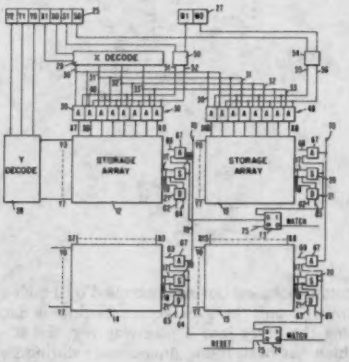
## HYBRID ASSOCIATIVE MEMORY

Arnold Weinberger, Newburgh, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,834

Int. Cl. G11c *15/00*, *5/02*

U.S. Cl. 340—173 AM 7 Claims

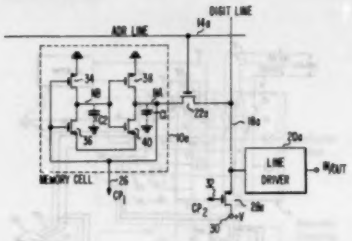



A memory is disclosed in which words are located by both associative and nonassociative addressing. The nonassociative portion of the address defines a general category for the word being searched and a corresponding portion of the memory. The associative portion of the address is searched within the addressed portion of the memory without regard to the actual memory location. Conventional nonassociative storage cell arrays are arranged to be addressed as an associative memory of three-state storage cells.

## 3,644,907
## COMPLEMENTARY MOSFET MEMORY CELL

James R. Grichi, Catonsville, and James R. Hudson, Perryville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,603
Int. Cl. G11c 11/40, 7/00, 5/02
U.S. Cl. 340—173 FF 13 Claims

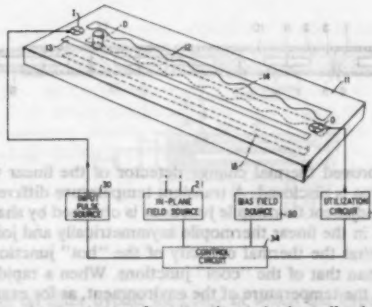



A semiconductor read/write memory array and memory cell therefore including complementary metal oxide semiconductor field-effect transistors (MOSFETs) coupled together as a first and a second inverter circuit with direct cross-coupled connections therebetween for providing a flip-flop circuit. Each bit of the memory array is comprised of at least five MOSFET devices operated from a single clocked power supply source wherein four of the MOSFET devices are operated as complementary pairs to comprise the first and second inverters. The flip-flop circuit is clocked or pulsed for turning the MOSFET devices "off" of one of the inverters referred to as the output inverter to trap an electrical charge at one of the circuit nodes in order to obtain a high input impedance so that the state of the cell can be changed when addressed or alternatively to preset the logic output state of the memory cell. The memory cell is coupled to a common input/output digit data line and an address line of the memory array by means of a selection switch MOSFET so that data is written into and read out of the memory cell on the same digit data line through the selection switch MOSFET when turned "on" by means of a signal applied to the address line. Furthermore, nondestructive readout of the state of the memory cell when addressed is achieved by precharging the digit data line to a predetermined potential prior to the energization of the selection switch MOSFET during the read mode.

## 3,644,908
## DOMAIN-PROPAGATION ARRANGEMENT

Andrew Henry Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1970, Ser. No. 50,778
Int. Cl. G11c 19/00, 11/14
U.S. Cl. 340—174 TF 11 Claims

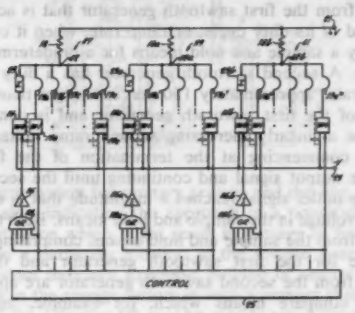



An arrangement for moving single-wall domains is described which employs an in-plane magnetic field to incline a domain from alignment with an axis of preferred magnetization of the material in which it is moved. As the in-plane field reorients, the orientation of the inclination changes. The changing domain inclination is converted to domain translation along an axis defined by a magnetic overlay in which a permanent magnetic pattern is printed.

## 3,644,909
## DRIVE ARRANGEMENT FOR READ-ONLY MEMORY

Jozef Furst, Mission Viejo, Calif., assignor to Datapac, Incorporated, Santa Ana, Calif.

Filed Aug. 10, 1970, Ser. No. 62,519
Int. Cl. G11c 17/00
U.S. Cl. 340—174 SP 12 Claims



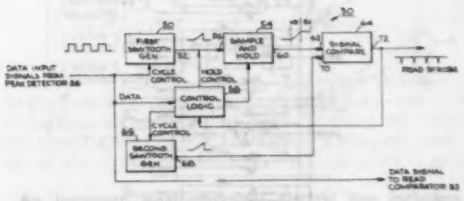

A linear transformer read-only memory of the type having an array of magnetic cores linked in different combinations by a large number of drive lines. Each core is also linked by an individual sense winding. Whenever a particular drive line is pulsed, the resultant current produces an output across the sense windings of those cores which that drive line links.

Several of the drive lines are pulsed through a common current-limiting resistor. Leakage currents in nonpulsed drive lines are reduced by an auxiliary load which is controlled to draw current through the common current-limiting resistor when none of the drive lines connected to that resistor is pulsed.

## 3,644,910
## READOUT CIRCUITRY WITH COMPENSATION FOR SPEED VARIATIONS

Gerald L. Smith, Garden Grove, Calif., assignor to Computer Mate, Inc., San Clemente, Calif.

Filed Sept. 16, 1970, Ser. No. 72,784
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1 H 17 Claims




An improved read control arrangement for reading the binary memory information content in a binary memory information signal independent of the memory medium or receiving device speed variations during the transmission of the binary information signal. A magnetic tape, for example, may have a binary type signal thereon and the tape may be driven by means that imparts variable speed and consequentially, a variable rate of binary signal information transmission from the tape. It will be appreciated that the variations in speed are those that will normally occur due to type of tape drive utilized, variations of tape speed during information write in, and/or the lack of costly devices to ensure a substantially constant speed tape drive. A binary data signal is generated from the binary information on the tape and

the binary data signal is applied to a read control means. The read control means receives the binary data signal and is provided with a first sawtooth generator, a sample and hold means, a second sawtooth generator, a signal compare means and a logic control means. The first sawtooth generator commences generating a linearly rising first ramp voltage signal when the binary signal goes from its low value magnitude state condition to its high value magnitude state condition and continues increasing in value throughout the entire high magnitude data signal pulse until it is terminated by the binary data signal going from the high value condition to the low value condition. The magnitude of the first ramp voltage signal from the first sawtooth generator that is achieved at the end of its duty cycle, or ramp rate, when it cuts off, is held by a sample and hold means for a predetermined time period. A second sawtooth generator has a duty cycle, or ramp rate, approximately 150 percent longer than the duty cycle of the first sawtooth generator and is controlled to provide a linearly increasing second ramp voltage output signal commencing at the termination of the first ramp voltage output signal and continuing until the second ramp voltage outlet signal reaches a magnitude that is equivalent to the voltage in the sample and hold means. Both the output signal from the sample and hold means, comprising the peak voltage for the first sawtooth generator and the output signal from the second sawtooth generator are applied to a signal compare means which, for example, may be an operational amplifier. When the second sawtooth generator output signal reaches the voltage value of the sample and hold means output signal the operational amplifier generates a read strobe pulse. The read strobe pulse may be utilized by a computer as a clock pulse reference signal to indicate the precise point of time when the binary information in the binary data signal may be read to obtain a correct reading of the information thereon. Appropriate controls are provided to recycle the two sawtooth generators and the sample and hold means after each cycle of operation.

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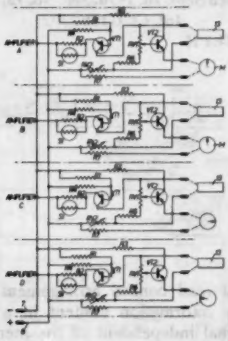
**3,644,911**

## REMOTE POSITION INDICATOR

**David John Wiles, Churchdown, Gloucester, and John Milford Wright, Tewkesbury, both of England, assignors to Dowty Hydraulic Units Limited**

**Filed Apr. 8, 1969, Ser. No. 814,257**
**Int. Cl. G08c *15/00***
**U.S. Cl. 340—177 VA** **5 Claims**



A remote position indicator for a movable member located in an inflammable atmosphere which comprises a variable resistor mechanically connected for adjustment by the movable member, an intrinsically safe power supply arranged to pass current through the variable resistor, an amplifier comprised entirely by one or more transistors and one or more resistors connected to receive the voltage signal delivered by the variable resistor, and a meter connected to receive the amplified signal delivered by the amplifier whereby to indicate the position of the movable member.

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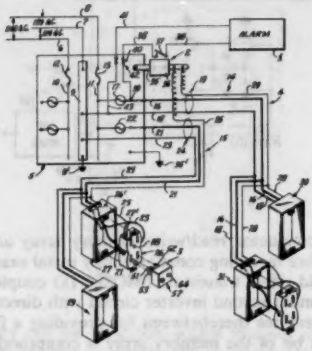
**3,644,912**

## ALARM SYSTEM

**Therron J. Allen, Jr., 7432 Westwood Park Lane, Falls Church, Va.**

**Filed Dec. 19, 1969, Ser. No. 886,669**
**Int. Cl. H04m *11/04***
**U.S. Cl. 340—213** **26 Claims**



An alarm system in which the ground conductor of the building is used to transmit a current from a detecting unit to a sensing unit which is at the fuse box or service entrance of the electrical system for the building. The detecting unit includes a switch which connects the hot wire of the wiring system to the ground conductor via a high-impedance load so that some current flows through the ground wire. The sensing unit operates an alarm when it detects current flow through the ground wire. The system eliminates the need for separate wiring from each detector unit to the central sensing unit and any room in the building or dwelling can be provided with a detecting unit simply by plugging the detecting unit into an electrical outlet. An indicator on each detecting unit provides a visual indication of the correct ground wiring and the proper connection of the detecting unit to the wiring.

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**3,644,913**

## THERMAL CHANGE DETECTOR OF THE LINEAR THERMOPILE TYPE

**Masatoshi Matsui, Tokyo-to, Japan, assignor to Asano Bosai Kogyo Kabushiki Kaisha, Mitaka-shi, Tokyo-to, Japan**

**Filed Dec. 16, 1969, Ser. No. 885,505**
**Int. Cl. G01k *7/02*; H01v *1/32***
**U.S. Cl. 340—228 R** **10 Claims**

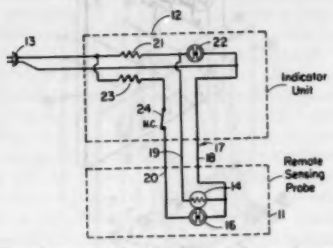
An improved thermal change detector of the linear thermopile type is disclosed. A transient temperature differential between adjacent thermopile junctions is obtained by shaping each link in the linear thermopile asymmetrically and joining them so that the thermal capacity of the "hot" junctions is smaller than that of the "cool" junctions. When a rapid rise occurs in the temperature of the environment, as for example when a fire breaks out, the "hot" junctions, having less thermal capacity, heat up more quickly than the "cool" junctions. This produces an electric potential across the thermopile which may be used to trigger alarm circuitry.

3,644,914

## SLUDGE INDICATOR FOR SEPTIC TANKS

James J. Veasaw, Middle Settlement Road, New Hartford, N.Y., and John P. Magyar, 1218 Kellog Avenue, Utica, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,833
Int. Cl. G08b 21/00
U.S. Cl. 340—236 1 Claim



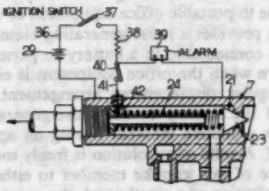

An opaque sensing device having a light-dependent resistor and a light source spaced apart so that material to be analyzed can be passed between them. The light-dependent resistor is connected to an impedance, such as a series resistor, across a voltage source to cause a fraction of the voltage to be present across the light-dependent resistor. A light source, such as a neon bulb, provides the only illumination to the resistor, and the impedance of the latter is therefore a measure of the opacity of the light path. When this sensing system is immersed in a septic tank, the buildup of sludge in the tank eventually reaches a level at which the light is interrupted, and the resistance of the light-dependent resistor changes, resulting in a change in voltage across it. This voltage is measured by an indicator outside of the septic system to determine when the sludge level has reached the immersed unit. The indicator may consist of a second neon bulb electrically connected across the light-dependent resistor. A normally closed switch may also be connected in series with the light source to interrupt current to the latter in order to create the effect of opaque matter to determine whether the indicator light will properly show a condition of opacity.

3,644,915

## FILTER BYPASS INDICATOR

James R. McBurnett, Stillwater, Okla., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 27, 1969, Ser. No. 853,463
Int. Cl. G08b 21/00
U.S. Cl. 340—239 F 6 Claims



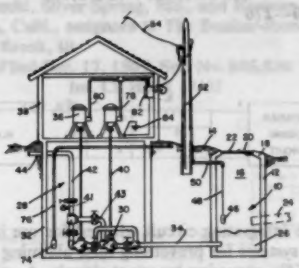

An oil filter bypass indicator in which the bypass valve is used as a switch to open and close an electrical circuit. The indicator may be a light bulb, a buzzer, or any suitable means to indicate the filter is not filtering and the oil is being bypassed around the filter through the bypass valve.

3,644,916

## SEWER LIFT ALARM SYSTEM

Clarence Oval Payne, Sr., 1813 N. Kickapoo, Shawnee, Okla.

Filed July 3, 1969, Ser. No. 838,838
Int. Cl. G08b 21/00
U.S. Cl. 340—244 4 Claims



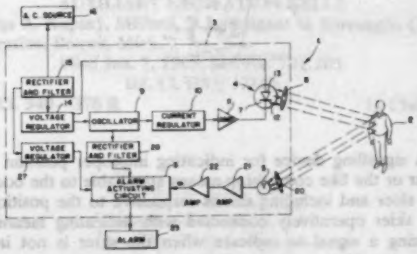
An alarm system for sanitary sewers, and the like, to provide an alert indicating the approach of a potentially dangerous situation which might result in damage or backup of sewage in a particular location in the sewage system. The signal system indicates excessive buildup of sewage in any sewer lift in the sewage system in such a manner that the location of the defective lift may be readily ascertained. In addition, the system is adapted for monitoring the overall situation at the sewer lift in order to determine the exact trouble, such as a power failure outside the system, power failure inside the system, inadequate operation of the pumping equipment, and the like. A repair of maintenance crew may be dispatched to the particular malfunctioning lift for correction of the difficulty prior to sufficient buildup of the sewage in the lift as to inflict damage in the surrounding area.

3,644,917

## SINGLE TERMINAL ELECTRO-OPTICAL INTRUDER DETECTION DEVICE

David E. Perlman, Rochester, N.Y., assignor to Detection Systems, Inc., East Rochester, N.Y.

Filed Sept. 18, 1969, Ser. No. 858,927
Int. Cl. G08b 17/10
U.S. Cl. 340—258 B 8 Claims

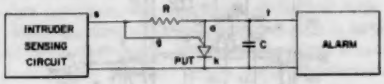



An improved single terminal electric eye including a modulated luminous diode as a source of radiant energy and an alarm-activating circuit for detecting any variation, above or below a steady-state level, in reflected energy incident upon the transducing element of the electric eye. The alarm-activating circuit comprises a pair of averaging circuits connected in series and a comparator, connected to the outputs of the averaging circuits, which transmits an alarm-activating signal whenever the outputs of the averaging circuits differ. When the transducer is subjected to constant modulated illumination, the outputs of the averaging circuits are at the same steady-state level. When, however, the illumination increases or decreases, the outputs of the averaging circuits tend to follow at different rates, thereby providing an unbalanced input to the comparator whereby an alarm signal may be transmitted.

## 3,644,918
## INTEGRATING CIRCUIT USING A PROGRAMMABLE UNIJUNCTION TRANSISTOR

David E. Perlman, Rochester, N.Y., assignor to Detection Systems Inc., Rochester, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,567
Int. Cl. H03k 17/28, 5/159
U.S. Cl. 340—276 2 Claims




A unique integrating circuit adapted for use in condition-responsive systems for preventing false alarming due to a series of rapidly occurring transient signals. A programmable unijunction transistor is used to rapidly discharge the capacitive element of the integrator in response to a slight decrease in input signal.

## 3,644,919
## SIGNALLING DEVICE FOR INDICATING IMPROPER POSITION OF A SKIER

William R. Mathauser, P.O. Box 5, Sun Valley, Idaho

Filed Dec. 18, 1970, Ser. No. 99,632
Int. Cl. G08b 21/00; A63b 69/18
U.S. Cl. 340—279 32 Claims

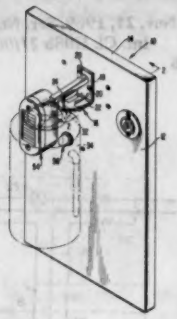
A signalling device for indicating improper position of a skier or the like comprising means attachable to the body of the skier and including means responsive to the position of the skier operatively connected with indicating means for causing a signal to indicate when the skier is not in the proper position.

## 3,644,920
## COMBINATION SUPPORT AND ALARM SYSTEM

Melvyn T. Cartledge, 57 Mobile Avenue, N.E., Atlanta, Ga.

Filed Jan. 27, 1969, Ser. No. 794,305
Int. Cl. G08b 13/14
U.S. Cl. 340—280 1 Claim

A panel mounts a hook having an upturned end and which is adapted to support an article and an actuator bar is pivoted to the panel and overlies the hook so that if the article is removed from the hook, the bar is displaced. An alarm circuit is actuated by displacement of the bar and includes a normally open switch adapted to be closed by the bar when displaced, a signalling device and a holding relay for maintaining energization of the alarm circuit when once tripped.

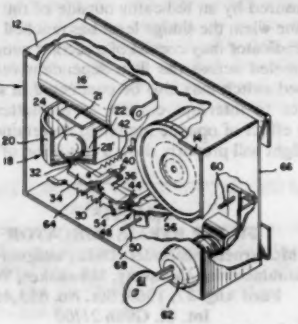


A key control switch is utilized to interrupt the effect of the holding relay.

## 3,644,921
## ALARM WITH TRUNDLE SWITCH

Richard E. Duggan, Glastonbury, Conn.; Bernard L. Sandberg, Kings Point; Manfred Reisner, Woodmere, and Allan J. Gascoigne, New York, all of N.Y., assignors to Cat Products, Inc., Melville, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,256
Int. Cl. G08b 13/02
U.S. Cl. 340—283 17 Claims

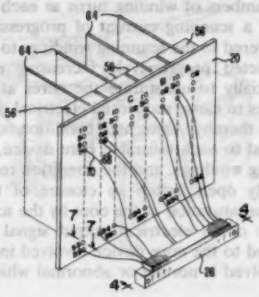


The invention relates to a burglar alarm system which may be connectable to portable office equipment of varying types. The invention provides a noise-generating element such as a horn which is connectable to a battery to permit the sounding of the horn when the office equipment is either tilted or lifted. An angular displacement arrangement permits the connection of the battery to the noise-generating element and comprises a cuplike member having an aperture in the center thereof. A solid of revolution is freely movable on the bottom surface of said cuplike member to either prevent or permit the projection of a pin through the aperture, when the office equipment or other portable equipment on which the burglar alarm is installed, is either tilted or moved. The pin prevents the solid of revolution from shutting off the alarm system once the solid of revolution is moved from its normal position over the aperture, so that the alarm sound continues until the alarm is reset by a key mechanism.

## 3,644,922
## HIGH-RESOLUTION FIBER OPTIC DISPLAY AND MICROFILM PRINTER

Richard N. James; James E. Applequist, both of San Jose, and Daniel M. Roberts, Saratoga, all of Calif., assignors to Image Products Corporation, Santa Clara, Calif.

Filed July 14, 1969, Ser. No. 841,485
Int. Cl. G09f 9/34
U.S. Cl. 340—324 R 6 Claims

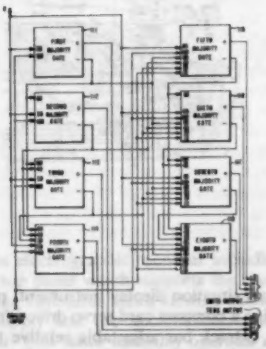


A computer output display with a plurality of light sources shining through optical fibers. A line of rectangular fiber bundles at the display end display selected characters depending on which fibers are illuminated in each bundle, and the light source ends of fibers from different bundles are connected to common light sources so that the same characters are displayed simultaneously on many bundles in the line. Scanning means for the line limits the operative area of the line at any instant to a set of fiber bundles which can all display different characters. The fibers are woven from a continuous strand while the fiber portions which end up as the light displaying and light receiving ends of individual fibers are properly supported in a line and collected into bundles respectively.

## 3,644,923
## THRESHOLD AND MAJORITY GATE ELEMENTS AND LOGICAL ARRANGEMENTS THEREOF

Roy P. Foerster, Thousands Oaks, Calif., assignor to The Bunker-Ramo Corporation, Stamford, Conn.

Original application Aug. 24, 1966, Ser. No. 574,790, now Patent No. 3,522,445, dated Aug. 4, 1970. Divided and this application Jan. 22, 1970, Ser. No. 10,682
Int. Cl. H03k 13/00
U.S. Cl. 340—347 AD 10 Claims

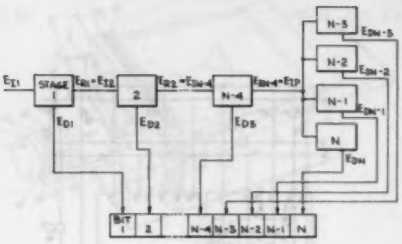


This invention relates to threshold and majority logic elements and threshold logic systems, and more particularly to improved threshold and majority gate circuit elements providing high "fan-in" and "fan-out" capabilities that permit the practical realization of threshold logic systems.

## 3,644,924
## ANALOG-TO-DIGITAL CONVERTER

Tome Kitaguchi, Silver Spring, Md., and Herman L. Renger, Calabasas, Calif., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Dec. 17, 1969, Ser. No. 885,836
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 6 Claims

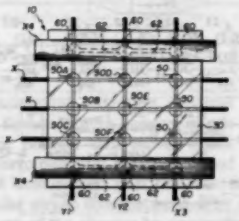


A converter responsive to analog input signals for providing "reflected binary" or Gray code output signals. The converter is comprised of a plurality of stages of essentially two types; i.e., serial-type stages and parallel-type stages. Each serial-type stage responds to an input signal applied thereto to yield both a bit output signal and a residual analog output signal. Two or more serial-type stages are connected in cascade with the residual analog output signal developed by each stage being applied as the analog input signal to a succeeding stage. The last cascaded stage provides its residual analog output signal in parallel to a plurality of parallel-type stages. Each parallel-type stage provides a bit output signal and is comprised of one or more differential comparators, each of which compares the level of the analog input signal applied thereto with a different decision level.

## 3,644,925
## GASEOUS DISCHARGE DISPLAY PANEL WITH AUXILIARY EXCITATION CELLS

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 7, 1969, Ser. No. 791,208
Int. Cl. H01j 17/30
U.S. Cl. 340—378 R 11 Claims



A display panel comprising a plurality of gas-filled cells, each having a pair of energizing electrodes and adapted to be energized in groups to display characters. The panel also includes a plurality of cells which are adapted to be energized so that they glow continuously and facilitate the turning on of the groups of cells which are used to display a character. These auxiliary energizing cells are hidden from view so that

they perform their function without being seen and without interfering with viewing of the primary characters.

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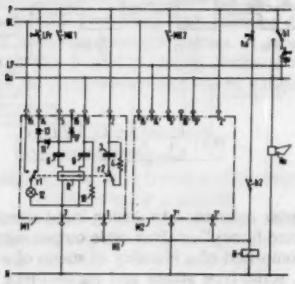
**3,644,926**

## CHECKBACK SYSTEM FOR VISUAL AND AUDIBLE INDICATION OF DETECTED PROCESSES

**Otto Wildgruber, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Nov. 3, 1969, Ser. No. 873,456**
**Claims priority, application Germany, Nov. 14, 1968, P 18 08 773.5**
**Int. Cl. G08b *23/00***
**U.S. Cl. 340—412** **4 Claims**



A checkback system for visual and audible indication of detected processes comprises a mosaic switchboard assembly having a plurality of identical modules. Each of the modules provides a continuous visual signal when it is in inoperative condition and an intermittent visual signal when it is in operative condition.

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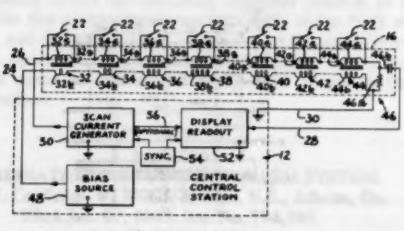
**3,644,927**

## EVENT MONITOR SYSTEM

**James Green, Los Angeles, Calif., assignor to Gulton Industries, Metuchen, N.J.**

**Filed May 27, 1969, Ser. No. 828,124**
**Int. Cl. G08b *26/00*, *23/00***
**U.S. Cl. 340—413** **15 Claims**




An event monitoring system for displaying information of the condition of a plurality of condition responsive means which may be electronic switches or relay contacts which have circuit opening and circuit closing conditions indicating two possible conditions (i.e., normal and abnormal) of the condition or variable being monitored. The event monitoring system includes saturable core devices having respective separate saturable cores most desirably each carrying a biasing winding and a scanning winding, the biasing windings being connected in series and the scanning windings being connected in series. The biasing windings have different numbers of turns with respect to one another so a predetermined magnitude of biasing current passing through the series connected biasing windings will saturate the cores to provide progressively increasing degrees of saturation in the cores. The series connected scanning windings have the same or similar numbers of winding turns as each other scanning winding and a scanning current of progressively increasing value is delivered to the scanning windings to develop an oppositely directed progressively increasing electromagnetic field sequentially to unsaturate the cores at predetermined current values to cause sequential electrical output signals to be generated thereby. Associated condition responsive means are connected to each saturable core device, such as across each scanning windings, and the condition responsive means is a normally open switch so closure of the switch will prevent the unsaturation of the core by the scanning current. The absence of an electrical output signal at the current value assigned to the core device involved indicates that the variable involved is normal or abnormal whichever the case may be.

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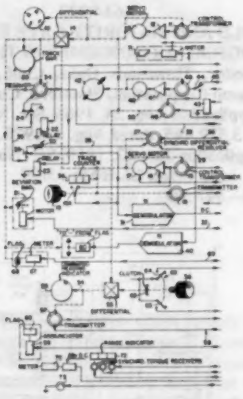
**3,644,928**

## HORIZONTAL SITUATION INDICATOR

**Jerauld George Wright, Ottawa, Ontario, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence**

**Filed Mar. 21, 1969, Ser. No. 809,358**
**Claims priority, application Canada, Mar. 29, 1968, 16,257**
**Int. Cl. G01s *1/46***
**U.S. Cl. 343—106 R** **38 Claims**



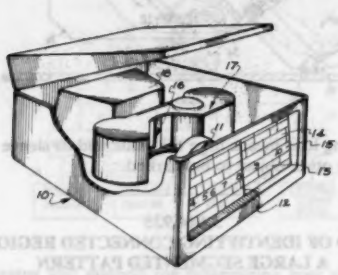
A horizontal situation display instrument, primarily for an aircraft, having a compass card servo driven from a gyrocompass system, a track bar adjustable relative to the compass card and movable therewith and a meter bar arranged to repeat radio bearing information of both geographical bearing and relative bearing.

3,644,929

## TELEVISION MONITORING AND PROGRAM INFORMATION DISPLAY DEVICE AND METHOD

Ethor S. Chavez, 7631 Pomelo Drive, Canoga Park, Calif.

Filed Sept. 21, 1970, Ser. No. 73,747
Int. Cl. H04h 9/00
U.S. Cl. 346—1 4 Claims



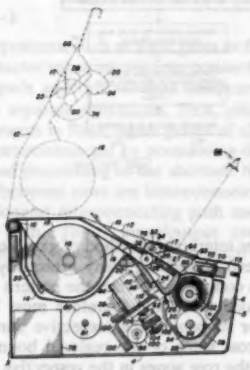
A continuous real time method for storing information as to which, if any, channel a particular television or radio set is tuned to, and the composition of the audience.

3,644,930

## MULTISTYLUS RECORDER

Klaus K. Stange, Pittsford, and Thomas K. Robinson, Jr., Rochester, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 2, 1969, Ser. No. 829,638
Int. Cl. G03g 15/22
U.S. Cl. 346—74 ES 10 Claims



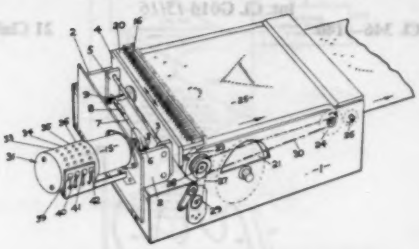
A multistylus electrographic recorder including a housing with a hinged top panel which supports the recording medium path defining structures and a viewing window as well as the medium supply and the manual/automatic driving assembly therefor. This latter assembly operates automatically with the top panel closed and is manually operable with the top panel in a loading position. Recording, developing and fusing apparatus are also disclosed.

3,644,931

## MULTISTYLI RECORDERS WITH STYLI CYCLICALLY MOVED THROUGH INTERSTYLUS SPACING

Philip Roland Stringer, and Eric Charles Gatland, both of Devonport, Auckland, New Zealand, assignors to The New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Sept. 10, 1969, Ser. No. 856,605
Claims priority, application New Zealand, Sept. 10, 1968, 153710
Int. Cl. G01d 15/06; H04n 1/12, 1/18
U.S. Cl. 346—74 E 5 Claims



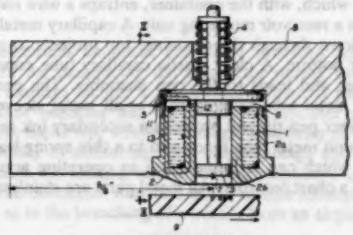
A multichannel recorder has a series of styli, movable cyclically transversely relative to a sheet of electrosensitive material movable longitudinally, the styli being connected individually to a source of voltage through individual trigger means, triggering of any trigger means causing the voltage to make a dot on the electrosensitive material at the position of the appropriate stylus, the combination of the motion and of the dot resulting in a readable trace appearing on the surface of the electrosensitive material.

3,644,932

## HIGH-SPEED INDENTING RECORDER

John G. Wallace, Ashland, and Edmund Schreiner, Newtonville, both of Mass., assignors to Synergistics, Inc.

Filed Oct. 8, 1969, Ser. No. 864,846
Int. Cl. G01d 15/02
U.S. Cl. 346—77 8 Claims



An electromechanical indenting recorder consists of a solenoid coil, a ferromagnetic housing about the coil, and a nonferromagnetic plunger that moves inside the core. The plunger has a ferromagnetic cover attached thereto which cover extends at least in part over the core and the housing forming an annular airgap therebetween. The cover serves to stop the movement of the plunger by contacting said housing, and the core cover, core and housing form a magnetic circuit with the airgap. An indenting knife is carried by one end of the plunger opposite from the cover and in operation serves to make a series of indentations, usually in a binary code form, in a suitable receptor sheet such as a pocket credit card. The plunger and cover are very light such that they can move rapidly under the influence of the magnetic field created when the solenoid is energized. The solenoid is ini-

tially energized and midway through the stroke of the plunger the driver current is cut off and the solenoid circuit remains closed through a diode such that the plunger continues accelerating towards the stop position under the influence of the decaying field of the magnetic circuit. The efficiency of the device is high and the excess heat generated is at a minimum.

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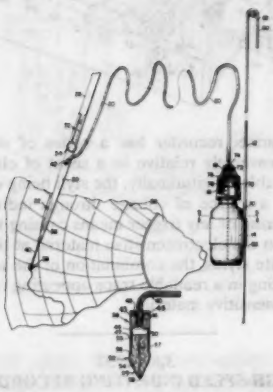
**3,644,933**

## RESERVOIR-TYPE INKING PEN SYSTEM

**Aubrey R. Tullos, and Leslie H. Creed, both of P.O. Box 2373, Odessa, Tex.**

**Filed May 26, 1969, Ser. No. 827,758**
**Int. Cl. G01d 15/16**
**U.S. Cl. 346—140** **21 Claims**



An inking pen system with an ink container reservoir being a small resilient plastic bottle held by an encircling metal slide clip which, with the container, entraps a wire rod or bar serving as a reservoir mounting unit. A capillary metal stinger passing down through the container top projects to near the container bottom. A clear plastic capillary tube connects to the stinger and leads to the pen assembly. The pen has a capillary metal tube secured to a small metal sleeve which holds a fiber pen tip and provides a secondary ink reservoir. The pen unit metal tube is secured to a thin spring leaf metal pen arm which can be fastened to an operating arm of, for example, a chart recorder. All metal parts are stainless steel.

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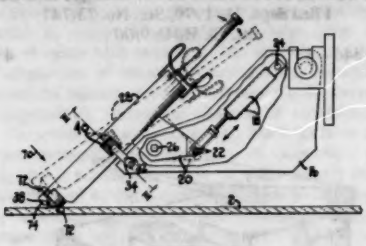
**3,644,934**

## DEFECT-MARKING DEVICE

**Charles T. Hawkins, Verona, and Laverne O. Parkhill, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 8, 1970, Ser. No. 79,244**
**Int. Cl. G01d 15/16**
**U.S. Cl. 346—141** **6 Claims**

Particularly for use in the inspection of flat glass ribbon or sheets traveling at over 200 inches a minute, there is disclosed apparatus actuated by an automatic defect-detecting system and comprising a plurality of chalk marker means. The chalk marker means include a sleeve grasping a piece of chalk, with toothlike serrations on the exterior of the sleeve. When air cylinder means operate to move the chalk to or from a marking position, a stationary leaf spring member engages the serrations and causes the chalk to be rotated, ensuring against its developing a flattened portion and failing to



mark. Spring load means urge the chalk and its sleeve toward the glass or other object to be marked.

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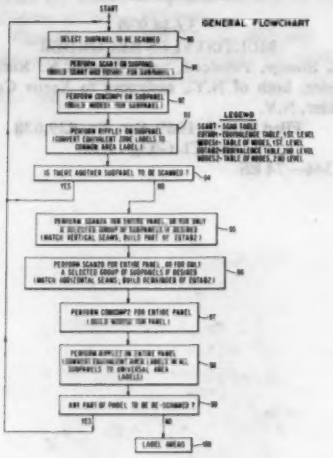
**3,644,935**

## METHOD OF IDENTIFYING CONNECTED REGIONS IN A LARGE SEGMENTED PATTERN

**Janice Richmond Lourie, New York, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 14, 1970, Ser. No. 37,282**
**Int. Cl. G06f 3/14**
**U.S. Cl. 444—1** **23 Claims**

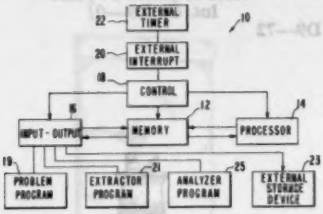



Man-computer interactive method of graphically analyzing an outline pattern containing many arbitrarily bounded regions or pattern components, when the pattern is too large to be scanned in one piece and therefore must be broken up into segments or subpanels, the respective borders of which may extend across some of the regional boundary lines. In each subpanel, the row zones in the respective regions or regional segments contained therein are scanned and labeled with identifying symbols. Each subpanel is then matched with its bordering subpanels to determine the equivalency of differently labeled subregions belonging to the same regional entity among the respective subpanels, and tables of connected "nodes" (zone labels, in this case) are set up on the basis of these equivalences. Each set of connected nodes then serves as a reference table for converting the different labels of its region (which may be in several subpanels) into a common or universal label for such region throughout the entire panel.

## 3,644,936
## METHOD FOR MEASURING PERFORMANCE OF A GENERAL PURPOSE DIGITAL COMPUTER

Gary M. Holtwick, Menlo Park, and Kenneth W. Kolence, Palo Alto, both of Calif., assignors to Boole & Babbage, Inc., Palo Alto, Calif.

Filed Jan. 23, 1970, Ser. No. 5,443
Int. Cl. G06f 9/19, 11/06, 7/02; G05b 23/02
U.S. Cl. 444—1 9 Claims




Apparatus and method for determining how a computer program is performing by sampling the operative conditions of a number of operating elements of a computer, such as the elements of the processing unit and the memory thereof. The information obtained from such sampling can be used to establish whether the program is "waiting," "executing" or "actively computing." Thus, a review of this information can be used to determine if the computer is being adequately utilized by the program and, if not, how it can be more efficiently utilized. The information is extracted randomly during the execution of the program following which the information is categorized and read out so as to be in an observable form.

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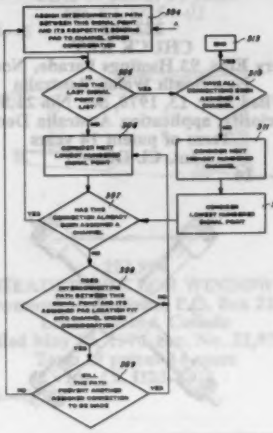
## 3,644,937
## CHANNEL-STACKING INPUT/OUTPUT INTERCONNECTIONS

Donald D. Isett, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1969, Ser. No. 841,859
Int. Cl. G06f 15/20
U.S. Cl. 444—1 13 Claims

Active components, such as logic gates or flip-flops formed in a semiconductor substrate are interconnected to input/output bonding pads and other active components in a circuit array in four separate operations. First, after arranging the active components in rows, signal points of all components in one row are interconnected by considering the longest interconnection and proceeding to the shortest. Next, component signal points between rows are interconnected again by considering the longest interconnecting path and proceeding to the shortest path. Third, input/output component signal points are assigned to input/output conductive pads. Finally, interconnecting paths are completed between the input/output component signal points and an assigned pad in a numbered order. Each operation uses a distinct algorithm to complete the necessary steps.



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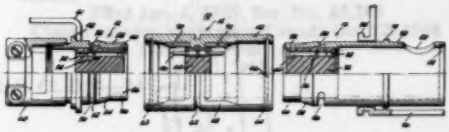
## 3,644,938
## UMBILICAL CONNECTOR

Claude C. Slate, Glendale, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 3, 1969, Ser. No. 873,556
Int. Cl. H01r 13/54
U.S. Cl. 339—91 R 4 Claims

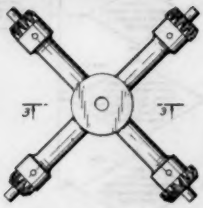


An electrical umbilical connector provided with detent structure for deadfacing the connector during use thereof. Salient features include a throwaway connector part utilized for circuit breaking and for protecting another connector part from flame and weather damage, simplicity of construction, facility of assemblage and disassemblage and cooperable detents for locking and unlocking respective connector parts. The connector may find use in missile launching applications as in the launching of a missile from an airplane.

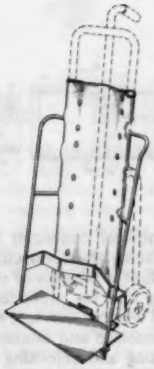
# DESIGNS

## FEBRUARY 22, 1972

**222,985**
**CHUCK KEY**
**Josh Harry Ellis, 93 Hastings Parade, North Bondi, New South Wales, Australia**
**Filed Mar. 13, 1970, Ser. No. 21,898**
**Claims priority, application Australia Dec. 24, 1969**
**Term of patent 14 years**
**Int. Cl. D8—*05***
**U.S. Cl. D8—14**



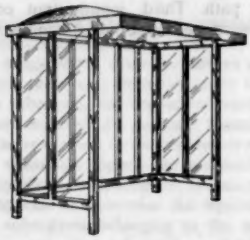
**222,986**
**CURRENCY HAND TRUCK**
**Robert M. MacTarnahan, 11416 SW. Lynnridge, Portland, Oreg. 97225**
**Filed Nov. 20, 1970, Ser. No. 26,100**
**Term of patent 14 years**
**Int. Cl. D12—*02***
**U.S. Cl. D14—3**



**222,987**
**LIFT GATE LATCH BOLT**
**Merritt A. Osborn, Cleveland Heights, Ohio, assignor to Esco Manufacturing, Inc., Chagrin Falls, Ohio**
**Filed Aug. 21, 1970, Ser. No. 24,636**
**Term of patent 14 years**
**Int. Cl. D8—*06***
**U.S. Cl. D8—131**

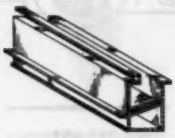
**222,988**
**BOTTLE**
**Robert H. Knies, Fullerton, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.**
**Filed Aug. 5, 1970, Ser. No. 24,316**
**Term of patent 14 years**
**Int. Cl. D9—*01***
**U.S. Cl. D9—72**

**222,989**
**BUS SHELTER**
**Arthur Merrill Cohen, 100—11 67th Road, Forest Hills, N.Y. 11375**
**Filed Mar. 3, 1970, Ser. No. 21,717**
**Term of patent 14 years**
**Int. Cl. D25—*03***
**U.S. Cl. D13—1**



222,990
**TELEPHONE MOUNTING SHELF**
Richard Dale Gibson, Indianapolis, Ind., John Neil McGarvey, Drexel, Pa., and Kenneth Burton Woodard, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 21 ,1970, Ser. No. 25,590
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1

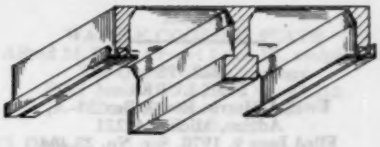
222,991
**EXTRUDED PLASTIC WINDOW STRIP**
Raymond M. Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed May 14, 1970, Ser. No. 22,970
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



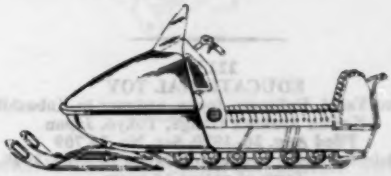
222,992
**FLAT TRIM STRIP**
Raymond M. Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed May 14, 1970, Ser. No. 22,971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6

222,993
**EXTRUDED PLASTIC WINDOW TRIM STRIP**
Raymond M. Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed May 14, 1970, Ser. No. 22,972
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6

222,994
**HEADER BOX FOR WINDOW**
Raymond M. Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed May 14, 1970, Ser. No. 22,975
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



222,995
**SNOWMOBILE COWL**
Yves Anselme Lapointe, Quebec City, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Jan. 6, 1969, Ser. No. 15,208
Claims priority, application Canada Oct. 22, 1968
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

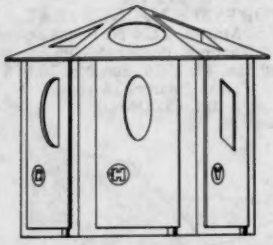


222,996
**PORTABLE LOUNGE SEAT**
Bruce S. Martin, 2224 N. Puget Sound, Tacoma, Wash. 98406
Filed Jan. 19, 1970, Ser. No. 20,978
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—8

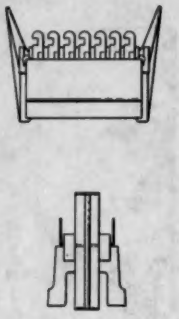
222,997
CHAIR
Howard M. Edgar, Torrance, and Reese Lewis, San Francisco, Calif., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Apr. 13, 1970, Ser. No. 22,376
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—1

222,998
FISH LURES
Ewell J. Harris, Rte. 3, Box 35–A, Adrian, Mich. 49221
Filed June 9, 1970, Ser. No. 23,404
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

222,999
EDUCATIONAL TOY
Ichiro Tachi, Fujisawa, Japan, assignor to Kabushiki Kaisha Asakusa Gangu, Tokyo, Japan
Filed Aug. 26, 1970, Ser. No. 24,709
Claims priority, application Japan Feb. 26, 1970
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1

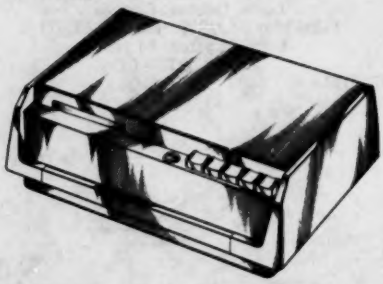


223,000
ELECTRICAL CONNECTOR PRIMARILY INTENDED FOR CONNECTION TO A DUAL-IN-LINE INTEGRATED CIRCUIT
Ronald Henry Trickey, Hoddesdon, Hertfordshire, England, assignor to Electrosil Limited, Sunderland, England
Filed May 23, 1969, Ser. No. 17,307
Claims priority, application Great Britain Nov. 29, 1968
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



223,001
ELECTRICAL TESTER
Joseph L. Bonanno, South Orange, N.J., assignor to Rapid Tool and Manufacturing Co., Inc.
Filed Jan. 25, 1971, Ser. No. 109,735
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1

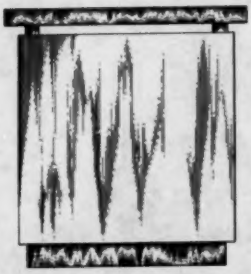
223,002
DATA COLLECTION COMPONENT
James W. Kelso, Los Angeles County, Calif., assignor to MSI Data Corporation, Montclair, Calif.
Filed Dec. 2, 1970, Ser. No. 26,250
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



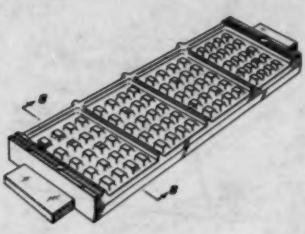
223,003
ENERGY REFLECTOR
Frederick R. Ruble, Stow, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed Nov. 21, 1969, Ser. No. 20,227
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

223,004
CHRISTMAS ORNAMENT
Katherine B. Vandewater, P.O. Box 184, Sherwood, Oreg. 97140
Filed May 6, 1970, Ser. No. 22,845
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D29—1

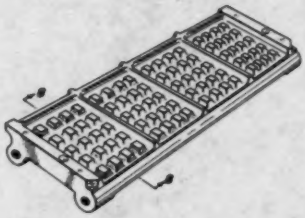
223,005
TABLE
Donald Michael Genaro, Haworth, and Rembert Ryan Stokes, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 15, 1970, Ser. No. 23,495
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



223,006
WAFFLE COOKING PLATE
Alfred M. Price, Crystal Lake, Ill., assignor to The Quaker Oats Company
Filed June 4, 1970, Ser. No. 23,308
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

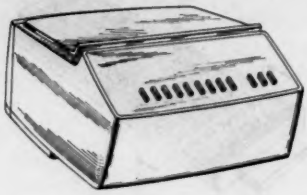


223,007
WAFFLE COOKING PLATE
Alfred M. Price, Crystal Lake, Ill., assignor to The Quaker Oats Company
Filed June 4, 1970, Ser. No. 23,312
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1



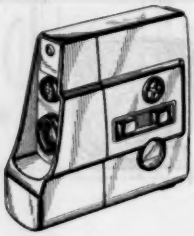
223,008
LOCKING TAPE MEASURE OR SIMILAR ARTICLE
Robert J. Gould, Fairfield, Conn., assignor to Evans-Aristocrat Industries, Inc., Elizabeth, N.J.
Filed Oct. 12, 1970, Ser. No. 25,430
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1

223,009
POSTAL SCALE
Marvin E. Garfinkle, Stamford, Robert E. Schmeck, Old Greenwich, and Einar W. Tangard, Norwalk, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.
Filed Aug. 27, 1970, Ser. No. 24,725
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10

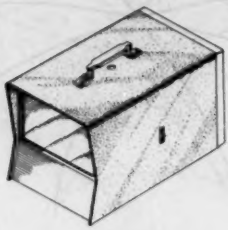


223,010
CONTACT LENS CASE
Frederic M. Kirchner and Allan A. Isen, Buffalo, N.Y., assignors to Griffin Laboratories Incorporated, Buffalo, N.Y.
Filed Sept. 25, 1970, Ser. No. 25,189
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

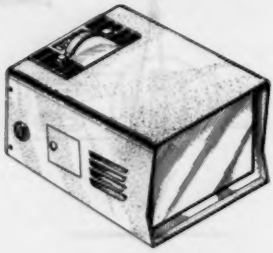
223,011
MOTION MOVIE CAMERA
Masahiro Fukuda, Tokyo, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan
Filed June 4, 1970, Ser. No. 23,318
Claims priority, application Japan Dec. 11, 1969
Term of patent 14 years
Int. Cl. D16—
U.S. Cl. D61—1



223,012
REAR PROJECTION VIEWER
Carl S. Shirley, 6049 Woodmont Road, Alexandria, Va. 22307
Continuation-in-part of abandoned design application Ser. No. 21,137, Jan. 29, 1970. This application Oct. 23, 1970, Ser. No. 25,623
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1

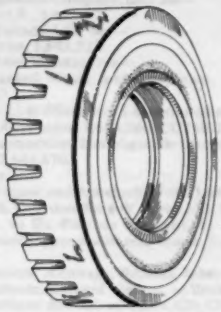


223,013
REAR PROJECTION VIEWER
Carl S. Shirley, Alexandria, Va., assignor to General Educational Technology Corporation, Alexandria, Va.
Continuation-in-part of abandoned design application Ser. No. 21,137, Jan. 29, 1970. This application Oct. 23, 1970, Ser. No. 25,624
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



223,014
COMBINED WRITING IMPLEMENT AND HOLDER
Roland Longarzo, 218 Hollywood Ave., Valley Stream, N.Y. 11581
Filed Aug. 14, 1970, Ser. No. 24,497
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

223,015
**TIRE DESIGN FOR LOADER TIRE**
Marvin E. Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed May 27, 1970, Ser. No. 23,174
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



223,016
**TIRE**
Raymond P. Hawkinson, 4800 Bywood W., Minneapolis, Minn. 55436
Continuation-in-part of design application Ser. No. 14,088, Oct. 21, 1968. This application Feb. 20, 1970, Ser. No. 21,547
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 22D DAY OF FEBRUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abuel-Haj, Marwan J., to Pfizer Inc. 3-Substituted methylquinoxaline-2-carboxamide-1,4- dioxides. 3,644,360, Cl. 260-250.

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Achelpohl, Fritz: *See*—
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Adair, Raymond K. S. Overshoe for golf. 3,643,352, Cl. 36-7.3

Adams, Charles D., to Du Pont de Nemours, E. I., and Company. Synthesis of 2-ureidooxypropionic acid esters. 3,644,491, Cl. 260-483.

Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, to Boots Pure Drug Company Limited. Xanthene derivatives. 3,644,420, Cl. 260-335.

Adolph, Horst G.; and Kamlet, Mortimer J., to United States of America, Navy. Bis (2-fluoro-2,2-dinitroethyl) amides. 3,644,519, Cl. 260-561.

Aerojet-General Corporation: *See*—
Frankel, Milton B.; Gold, Marvin H.; and Marcus, Henry J., 3,644,494.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bestenreiner, Friedrich; Deml, Reinhold; Greis, Ulrich; and Pfeifer, Josef, 3,644,019.
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Agnihotri, Ram K., to International Business Machines Corporation. Polydiacrylyl photosensitive compositions. 3,644,118, Cl. 96-115.

Agrecology, Incorporated: *See*—
Houston, Richard K., 3,643,442.

Ahy, Jahangir Madjidi. Signal recording and/or playback apparatus. 3,643,963, Cl. 274-43.

Ainsworth, John Desmond, to English Electric Company, Limited, The. Control circuits for invertors. 3,644,820, Cl. 321-52.

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Atsumi, Katsuya, 3,643,895.

Akell, Robert B., to Du Pont de Nemours, E. I., and Company. Emulsion breaking. 3,644,214, Cl. 252-320.

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Tachibana, Sachihiko; Nakai, Susumu; Makino, Yoichi; Matsumura, Hisashi; Tabuchi, Kimitaka; Hiraoka, Michio; Akoh, Shigeichi; and Orito, Hiroshi,3,644,078.

Aktiebolaget Astra: *See*—
Carlsson, Per Arvid Emil; Corrodi, Hans Hudolf; Florwall, Gosta Linnart; and Ross, Svante Bertil, 3,644,623.

Aktiebolaget Bofors: *See*—
Karlsson, Hans Egron, 3,643,994.

Aktiebolaget Svenska Kullagerfabriken: *See*—
Nilsson, Sven Walter, 3,643,521.

Albee, Thomas K., to Bunker-Ramo Corporation, The. Impedance compensated switch for a rectangular waveguide. 3,644,852, Cl. 333-98.

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Taylor, Paul A.; and Boissevain, Thomas A., 3,643,601.

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Alexander, L. Bruce: *See*—
Bushman, Ronald C.; Rickard, Donn J.; Webb, John D.; Alexander, L. Bruce; and Church, Cleveland B.,3,643,716.

Alexandre, Philippe, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Automatic constant downstream level gate. 3,643,443, Cl. 61-22.

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Sureau, Robert Frederic Michel; Alicot, Marie-Josephe Jeanne; and Dupre, Victor Marie,3,644,389.

All-Steel Equipment Inc.: *See*—
Harris, Everett K.; Ericson, John P.; and Miller, Richard E., 3,643,323.

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Allard Instrument Corporation: *See*—
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Hartley, David; Lunts, Lawrence H. C.; and Jack, David, 3,644,520.

Allen and Hanburys Limited: *See*—
Lunts, Lawrence H. C.; and Toon, Paul, 3,644,353.

Allen, Donald J.; and Bondi, Joseph V., to Merck & Co., Inc. Indomethacin suppositories. 3,644,630, Cl. 424-274.

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Allen, Therron J., Jr. Alarm system. 3,644,912, Cl. 340-213.

Allen, Wilford W. Food seasoner apparatus. 3,643,838, Cl. 222-161.

Allen, William M.: *See*—
Harrington, Herbert A.; Allen, William M.; and Kuhn, William C.,3,643,587.

Allen-Bradley Company: *See*—
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Sweeney, Richard F.; Price, Alson K.; and Khan, Aziz U., 3,644,513.
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Tate, Bryce E.; and Allingham, Robert P.,3,644,635.

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Altenpohl, William F.; and Altenpohl, Paul J. Non-jam lead-on track for conveyor systems. 3,643,790, Cl. 198-177.

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Aluotto, Dominick M., to Aluotto, Antonio, d/b/a National Baling Press and Equipment Co. Vertical-horizontal baling press. 3,643,590, Cl. 100-53.

Alvey Inc.: *See*—
Werntz, Charles W., 3,643,788.
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Amano, Kitsutaro; Ota, Chuichi; Hashimoto, Masao; Kanzaki, Hisao; Sakamoto, Yasuhiko; and Yososhima, Nobuyaki, to Fujitsu Limited. Time assignment speech interpolation control system. 3,644,680, Cl. 179-15.

Amato, Joseph John, to United States Surgical Corporation. Mechanized tracheotome. 3,643,649, Cl. 128-1.

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American Home Products Corporation: *See*—
Douglas, George H.; Teller, Daniel M.; and Smith, Herchel, 3,644,440.
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Tilley, Colin; Watson, David Harris; and Campbell, Michael, 3,644,568.

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Andrews, Paul A.; and Coyle, Bernard T., Jr., to Polaroid Corporation. Identification cards having diffusion transfer laminations. 3,644,116, Cl. 96-29.

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Anthony, William Crawford, to Upjohn Company, The. Compounds and process. 3,644,364, Cl. 260-256.4

Antkowiak, Thomas A.: *See—*
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Argentina, Giltan Michael: *See—*
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Arnold, Donald R.; Trecker, David J.; and Stehr, Charles E., to Union Carbide Corporation. Polycyclic dimercaptans. 3,644,532, Cl. 260-609.

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Zeile, Karl: *See—*
Koppe, Herbert; Engelhardt, Albrecht; Ludwig, Gerhard; and Zeile, Karl,3,644,636.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Zeile, Karl; and Traunecker, Werner,3,644,469.

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Ziering, Sigi. Numeral base conversion instructional device. 3,643,347, Cl. 35-30.

Zimmer, George H., to Robbins & Myers, Inc. Pump with macerator. 3,643,877, Cl. 241-46.02

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# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 22ND DAY OF FEBRUARY, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams-Russell Co., Inc.: *See*—
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Amerock Corp.: *See*—
Fowler, Roland V. Re. 27,291.
D'Ercoli, Giacinto C.: *See*—
Johnson, Howard W., D'Ercoli, and Knize. Re. 27,297.
Folino, Arthur S. Process of printing numbers on forms. Re. 27,298, 2–22–72, Cl. 270—1.
Fowler, Roland V., to Amerock Corp. Latching device. Re. 27,291, 2–22–72, Cl. 292—113.
Fredd, John V., to Otis Engineering Corp. Operator devices. Re. 27,294, 2–22–72, Cl. 91—41.
Grolet, Pierre, P. Moulin, and J. Parola, to Institut Francais du Petrol des Carburants et Lubrifiants. Apparatus for submarine core drilling. Re. 27,292, 2–22–72, Cl. 175—6.
Hamilton Watch Co.: *See*—
Rogers, Donald J., and Van Horn. Re. 27,290.
Ichikawa, Yataro, to Teijin Ltd. Process for the preparation of aromatic carboxylic acids. Re. 27,296, 2–22–72. Cl. 260—524.
Institut Francais du Petrole des Carburants et Lubrifiants: *See*—
Grolet, Pierre, Moulin, and Parola. Re. 27,292.
Johnson, Howard W., G. C. D'Ercoli, E. J. Knize, to Solo Cup Co. Dispenser with cup supporting bristles. Re. 27,297, 2–22–72, Cl. 221—308.
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Johnson, Howard W., D'Ercoli, and Knize. Re. 27,297.
Ludwig, Carl, to McDowell-Wellman Engineering Co. Railroad car pushing apparatus. Re. 27,300, 2–22–72, Cl. 104—176.
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Pechacek, Joseph H. Applicator apparatus attachable to a wheeled agricultural implement. Re. 27,295, 2–22–72, Cl. 222—176.
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Schmeck, Robert E.: *See*—
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Shirley, Carl S. Rear projection viewer. 223,012, 2–22–72, Cl. D61—1.
Shirley, Carl S., to General Educational Technology Corp. Rear projection viewer. 223,013, 2–22–72, Cl. D61—1.
Stokes, Rembert R.: *See*—
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Tangard, Einar W.: *See*—
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Trickey, Ronald H., to Electrosil Ltd. Electrical connector primarily intended for connection to a dual-in-line integrated circuit. 223,000, 2–22–72, Cl. D26—1.
Vandewater, Katherine B. Christmas ornament. 223,004, 2–22–72, Cl. D29—1.
Woodward, Kenneth Burton: *See*—
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# CLASSIFICATION OF PATENTS

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206 3,643,660
263 3,643,661
287 3,643,662
303.17 3,643,663
353 3,643,664
403 3,643,665

**CLASS 130**

27JT 3,643,666

**CLASS 131**

2 3,643,667
3,643,668
84C 3,643,669

**CLASS 134**

117 3,643,670
118 3,643,671
143 3,643,672

**CLASS 135**

20 3,643,673
25 3,643,674

**CLASS 136**

6 3,644,145
76 3,644,146
86D 3,644,147
86E 3,644,148
135S 3,644,149
137 3,644,150

**CLASS 137**

13 3,643,675
15.2 3,643,676
113 3,643,677
209 3,643,678
241 3,643,679
331 3,643,680
429 3,643,681
484.8 3,643,683
489 3,643,682
493.7 3,643,684
501 3,643,685
512 3,643,686
3,643,687
556 3,643,688
561 3,643,689
587 3,643,690
590 3,643,691
599.1 3,643,692
608 3,643,693
3,643,694
614.04 3,643,695
625.17 3,643,697
625.23 3,643,698
625.6 3,643,696
625.64 3,643,699
625.68 3,643,700

**CLASS 138**

97 3,643,701
121 3,643,702

**CLASS 141**

1 3,643,703
106 3,643,704
141 3,643,705
160 3,643,706
286 3,643,707

**CLASS 144**

2Z 3,643,708
3,643,711
3D 3,643,709
3R 3,643,710
34E 3,643,712
86 3,643,713
176 3,643,714
209A 3,643,715

**CLASS 146**

3N 3,643,716
28A 3,643,717
94 3,643,718
98 3,643,719
120 3,643,720
241 3,643,721

**CLASS 148**

1.6 3,644,151
6.15R 3,644,152
31.5 3,644,153
187 3,644,154

**CLASS 151**

22 3,643,722

**CLASS 152**

361 3,643,723

**CLASS 156**

20 3,644,155
90 3,644,156
160 3,644,157
197 3,644,158
210 3,644,159
250 3,644,160
272 3,644,161
415 3,644,162
583 3,644,163

**CLASS 161**

25 3,644,164
58 3,644,165
89 3,644,166
125 3,644,167
160 3,644,168

**CLASS 162**

21 3,644,170
70 3,644,171

**CLASS 164**

4 3,643,724
44 3,643,725
52 3,643,726
76 3,643,727
132 3,643,728
170 3,643,729
235 3,643,730
274 3,643,731
309 3,643,732

**CLASS 165**

81 3,643,733
96 3,643,734
172 3,643,735

**CLASS 166**

.5 3,643,736
216 3,643,737
241 3,643,739
252 3,643,738
265 3,643,740
295 3,643,741

**CLASS 172**

316 3,643,742
320 3,643,743
372 3,643,744
413 3,643,745
445 3,643,746
657 3,643,747
704 3,643,748

**CLASS 173**

12 3,643,749
170 3,643,750

**CLASS 174**

17LF 3,644,658
27 3,644,659
42 3,644,660
68.5 3,644,661
73R 3,644,662
88B 3,644,663

**CLASS 175**

6 Re.27,292
7 3,643,751

**CLASS 176**

19LD 3,644,172
42 3,644,173
68 3,644,174

**CLASS 177**

122 3,643,752
185 3,643,753

**CLASS 178**

5.2A 3,644,664
5.4R 3,643,294
6.5 3,644,665
6.8 3,644,666
3,644,667
7.1 3,644,668
7.5R 3,644,669
17B 3,644,670
18 3,644,671
69G 3,644,672
88 3,644,673

**CLASS 179**

1P 3,644,674
2AS 3,644,675
15AQ 3,644,679
15AS 3,644,680
15AW 3,644,677
15BA 3,644,678
15A 3,644,676
41A 3,644,681
100.1C 3,644,682
100.2B 3,644,683
3,644,685
100.2Z 3,644,684
161 3,644,686
175.3 3,644,687

**CLASS 180**

69C 3,643,755
103 3,643,756
127 3,643,757
128 3,643,758

**CLASS 181**

40 3,643,759
48 3,643,760

**CLASS 182**

19 3,643,761

**CLASS 187**

29R 3,643,762

**CLASS 188**

71.8 3,643,763
3,643,764
170 3,643,765
190 3,643,766

**CLASS 191**

40 3,644,688

**CLASS 192**

21 3,643,767
41A 3,643,768
51 3,643,769
56R 3,643,770

**CLASS 195**

28R 3,644,175
51R 3,644,176
103.5R 3,644,177

**CLASS 197**

6.7 3,643,771
14 3,643,772
16 3,643,773
18 3,643,774
66 3,643,775
114R 3,643,776
151 3,643,777
3,643,778
3,643,779

**CLASS 198**

25 3,643,780
28 3,643,781
30 3,643,782
33AA 3,643,783
38 3,643,784
75 3,643,785
127R 3,643,788
127 3,643,789
131 3,643,787
173 3,643,786
177R 3,643,790
184 3,643,791
189 3,643,792
192R 3,643,793

**CLASS 200**

11J 3,644,689
61.5 3,644,690
84R 3,644,691
166C 3,644,692
3,644,693
167R 3,644,694

**CLASS 203**

29 3,644,178
72 3,644,179

**CLASS 204**

15 3,644,180
3,644,181
26 3,644,182
38B 3,644,183
46 3,644,184
140.5 3,644,185
159.2 3,644,186
186 3,644,187
192 3,644,188
209 3,644,189
228 3,644,190
298 3,644,191

**CLASS 206**

16B 3,643,794
45.14 3,643,795
65E 3,643,796

**CLASS 208**

8 3,644,192
11 3,644,193
3,644,194
33 3,644,195
62 3,644,196
89 3,644,197
111 3,644,198
120 3,644,199
3,644,200
308 3,644,201

**CLASS 209**

2 3,643,797
73 3,643,799
74 3,643,798
144 3,643,800

**CLASS 210**

23 3,644,202
169 3,643,801
172 3,643,802
232 3,643,803
242 3,643,804
321 3,643,805
327 3,643,806

**CLASS 211**

10 3,643,807
49D 3,643,808
49 3,643,809
60SK 3,643,810
64 3,643,811
74 3,643,812
75 3,643,813
177 3,643,814

**CLASS 212**

1 3,643,815

**CLASS 214**

6BA 3,643,817
6G 3,643,818
6H 3,643,816
17CB 3,643,819
17D 3,643,820
140 3,643,821
152 3,643,822
310 3,643,823
510 3,643,824
512 3,643,825
519 3,643,826
653 3,643,827
762 3,643,828

**CLASS 215**

1C 3,643,829

**CLASS 219**

8.5 3,644,695
10.57 3,644,696
74 3,644,697
83 3,644,698
113 3,644,699
121EB 3,644,700
130 3,644,701
201 3,644,702
3,644,703
202 3,644,704
211 3,644,705
3,644,706
302 3,644,707
386 3,644,708
439 3,644,709
463 3,644,710

**CLASS 220**

42B 3,643,831
44R 3,643,830
54 3,643,832
3,643,833

**CLASS 221**

308 Re.27,297

**CLASS 222**

54 3,643,834
56 3,643,835
70 3,643,836
101 3,643,837
161 3,643,838
176 Re.27,295
177 3,643,839

**CLASS 223**

42 3,643,840
95 3,643,841

**CLASS 226**

71 3,643,842
97 3,643,843
111 3,643,844
145 3,643,845
181 3,643,846
186 3,643,847
3,643,848
199 3,643,849

**CLASS 227**

8 3,643,850
19 3,643,851
149 3,643,852

**CLASS 228**

41 3,643,853

**CLASS 229**

2.5 3,643,855
14B 3,643,854
37R 3,643,856
44R 3,643,857
72 3,643,858

**CLASS 235**

61.1 3,644,711
61.11A 3,644,715
61.11E 3,644,714
61.12M 3,644,716
61.8R 3,644,712
61.9R 3,644,713
88 3,643,859
92EA 3,644,718
92C 3,644,717
95 3,643,860
150.1 3,644,719
3,644,720
150.23 3,644,722
150.3 3,644,721
156 3,644,723
159 3,644,724
201 3,643,861

**CLASS 236**

1 3,643,862
80 3,643,863

**CLASS 238**

8 3,643,864
10F 3,643,865

**CLASS 239**

101 3,643,866
183 3,643,867
265.39 3,643,868
289 3,643,869
403 3,643,870
419.3 3,643,871
655 3,643,872

**CLASS 240**

1 3,644,725
10R 3,644,726
47 3,644,727
61.9 3,644,728
73BC 3,644,729
103 3,644,730

**CLASS 241**

3 3,643,873
3,643,874
5 3,643,875
34 3,643,876
46.02 3,643,877
48 3,643,878
55 3,643,879
100 3,643,880

**CLASS 242**

4B 3,643,881
36 3,643,882
3,643,883
55 3,643,885
55.2 3,643,884
86.5A 3,643,886
107.3 3,643,887
118.32 3,643,888
182 3,643,889
3,643,890
189 3,643,891
192 3,643,892
195 3,643,893
201 3,643,894
3,643,895
205 3,643,896

**CLASS 244**

1 3,643,897
50 3,643,898
118P 3,643,899
123 3,643,900
130 3,643,901

**CLASS 248**

40 3,643,902
146 3,643,903
289 3,643,904
345.1 3,643,905
361 3,643,906
439 3,643,907

**CLASS 249**

27 3,643,908
41 3,643,909
65 3,643,910
170 3,643,911

**CLASS 250**

41.9 3,644,731
43.5D 3,644,732
49.5A 3,644,733
71R 3,644,734
91 3,644,735
108WS 3,644,737
108R 3,644,736
3,644,738
209 3,644,739
211J 3,644,740
213R 3,644,741
216 3,644,742
218 3,644,743

**CLASS 251**

5 3,643,912
11 3,643,913
124 3,643,914
148 3,643,915
151 3,643,916
215 3,643,917

**CLASS 252**

8.55B 3,644,205
8.75 3,644,203
8.8 3,644,204
46.7 3,644,206
62.59 3,644,207
72 3,644,208
78 3,644,209
301.2 3,644,211
301.6F 3,644,212
313S 3,644,213
320 3,644,214
364 3,644,433
400 3,644,217
404 3,644,215
431C 3,644,218
442 3,644,219
3,644,220
455R 3,644,216
503 3,644,221
522 3,644,505
548 3,644,210

**CLASS 254**

19 3,643,918
98 3,643,919
124 3,643,920
138 3,643,921
172 3,643,922

**CLASS 256**

13.1 3,643,924
25 3,643,923

**CLASS 259**

1R 3,643,925
2 3,643,926
4 3,643,927
6 3,643,928
9 3,643,929

**CLASS 260**

2EA 3,644,222
2A 3,644,224
2 3,644,223
2.1E 3,644,225
3,644,226
2.3 3,644,227
2.5AD 3,644,229
2.5AJ 3,644,228
2.5AK 3,644,238
2.5AM 3,644,235
3,644,237
2.5AW 3,644,232
2.5AY 3,644,233
2.5E 3,644,230
2.5F 3,644,231
2.5 3,644,234
3,644,236
3,644,239
4R 3,644,240
17.4CL 3,644,242
17.4ST 3,644,241
18R 3,644,243
22CA 3,644,612
23XA 3,644,246
23R 3,644,244
23 3,644,245
23.7H 3,644,247
23.7M 3,644,248
23.7R 3,644,249
3,644,250
26 3,644,251
27R 3,644,252
28 3,644,253
28.5AV 3,644,254
29.1R 3,644,255
29.3 3,644,256
29.6MH 3,644,259
29.6WB 3,644,257
29.6F 3,644,260
3,644,261
29.6H 3,644,258
29.6R 3,644,262
29.7EM 3,644,263
30.2R 3,644,264
32.6N 3,644,265
32.8R 3,644,266
33.6R 3,644,267
38 3,644,268
3,644,269

40R 3,644,270
41A 3,644,273
3,644,274
41 3,644,271
3,644,272
45.7R 3,644,275
45.8A 3,644,276
45.8N 3,644,277
3,644,278
3,644,279
45.85R 3,644,284
45.85 3,644,281
3,644,282
45.9R 3,644,280
47CB 3,644,289
47CP 3,644,286
3,644,287
3,644,288
47CZ 3,644,283
47R 3,644,285
67TN 3,644,290
75M 3,644,294
75R 3,644,291
3,644,292
3,644,293
75S 3,644,295
78TF 3,644,299
78L 3,644,296
78R 3,644,297
3,644,298
78.4N 3,644,300
78.5R 3,644,301
79R 3,644,302
79.3R 3,644,303
79.5B 3,644,304
80.3N 3,644,305
80.71 3,644,306
80.73 3,644,307
80.75 3,644,308
80.78 3,644,309
3,644,310
3,644,311
83.7R 3,644,312
3,644,313
84.7 3,644,314
85.3 3,644,315
85.5R 3,644,316
85.5 3,644,317
88.2 3,644,318
92.1 3,644,319
93.7 3,644,320
3,644,321
94.2 3,644,322
94.7R 3,644,324
94.9C 3,644,325
94.9D 3,644,323
122 3,644,326
143 3,644,327
156 3,644,405
169 3,644,328
192 3,644,406
207.1 3,644,329
210.5 3,644,330
211.5R 3,644,331
233.3 3,644,332
234R 3,644,333
239BD 3,644,334
3,644,335
3,644,336
239.3B 3,644,338
239.3D 3,644,339
239.3P 3,644,337
239.55C 3,644,407
239.55D 3,644,340
239.55 3,644,341
3,644,342
240CA 3,644,345
240A 3,644,344
240G 3,644,346
240R 3,644,343
243C 3,644,347
243D 3,644,348
243R 3,644,349
244R 3,644,350
3,644,351
246B 3,644,408
247.2A 3,644,352
247.2 3,644,409
247.5R 3,644,353
3,644,354
248AS 3,644,358
248CS 3,644,410
248A 3,644,359
230A 3,644,355
3,644,362
250R 3,644,360
250 3,644,361
3,644,363
251A 3,644,356
256.4C 3,644,365
256.4H 3,644,364
256.5R 3,644,357
286R 3,644,366
287R 3,644,367
3,644,368
289R 3,644,369
289 3,644,370
290H 3,644,371
293.54 3,644,373
293.56 3,644,372
293.62 3,644,375
293.82 3,644,376
293.88 3,644,374
294.8B 3,644,379
294.8F 3,644,378
294.8G 3,644,377
294.9 3,644,380
295AM 3,644,383
295CA 3,644,381
295C 3,644,384
295F 3,644,382
295.5R 3,644,385
296R 3,644,386
3,644,387
297R 3,644,388
299 3,644,389
307B 3,644,390
3,644,412
309 3,644,391
3,644,392
309.6 3,644,393
310R 3,644,394
311 3,644,395
326.11 3,644,403
326.3 3,644,396
3,644,397
3,644,398
3,644,399
3,644,400
3,644,414
326.5FN 3,644,402
326.5 3,644,401
327TH 3,644,415
3,644,416
327B 3,644,417
327 3,644,404
333 3,644,418
3,644,419
335 3,644,420
340.5 3,644,421
340.9 3,644,422
3,644,423
3,644,424
343.2R 3,644,413
343.2S 3,644,425
343.5 3,644,426
345.1 3,644,427
3,644,428
345.9 3,644,429
348A 3,644,431
348R 3,644,430
348 3,644,432
375B 3,644,434
396R 3,644,435
397 3,644,436
397.3 3,644,437
397.4 3,644,438
3,644,439
3,644,440
397.47 3,644,441
400 3,644,442
413 3,644,443
429CY 3,644,445
429J 3,644,444
429R 3,644,446
3,644,447
429.9 3,644,448
431 3,644,449
437R 3,644,450
3,644,451
3,644,452
438.1 3,644,453
438.5C 3,644,454
439R 3,644,455
453AL 3,644,458
453AR 3,644,456
453SP 3,644,457
453A 3,644,459
453P 3,644,460
3,644,461
3,644,462
454 3,644,463
455A 3,644,464
463 3,644,465
465B 3,644,470
465D 3,644,466
3,644,467
3,644,468
465E 3,644,469
465G 3,644,471
465.3 3,644,472
465.8D 3,644,475
465.8 3,644,473
3,644,474
3,644,476
3,644,477
468R 3,644,478
469 3,644,479
473F 3,644,481
473R 3,644,480
3,644,482
475P 3,644,483
3,644,484
3,644,485
479R 3,644,486
481R 3,644,487
3,644,488
482B 3,644,490
482P 3,644,489
482R 3,644,491
484R 3,644,492
485H 3,644,493
3,644,494
491 3,644,495
494 3,644,496
497R 3,644,497
507R 3,644,498
513B 3,644,499
514R 3,644,500
3,644,501
3,644,502
514.5 3,644,503
515P 3,644,504
524R Re.27,296
3,644,506
525 3,644,507
526R 3,644,508
530N 3,644,509
533R 3,644,510
3,644,511
3,644,512
534E 3,644,513
534S 3,644,514
543P 3,644,516
543R 3,644,515
544M 3,644,517
559S 3,644,518
561K 3,644,519
562A 3,644,520
562R 3,644,521
563D 3,644,522
564G 3,644,523
566AE 3,644,524
570.5C 3,644,525
586B 3,644,526
586H 3,644,527
591 3,644,528
604HF 3,644,529
606.5P 3,644,530
607B 3,644,531
609D 3,644,532
612R 3,644,533
613D 3,644,534
615B 3,644,535
618R 3,644,536
619B 3,644,537
3,644,538
619R 3,644,539
626R 3,644,540
641 3,644,541
650R 3,644,542
3,644,543
653.7 3,644,544
3,644,545
657 3,644,546
658R 3,644,547
666B 3,644,548
669 3,644,549
673 3,644,550
3,644,551
674A 3,644,552
3,644,553
677XA 3,644,554
679R 3,644,555
680B 3,644,556
683D 3,644,559
683R 3,644,557
683.15D 3,644,562
3,644,563
3,644,564
683.2 3,644,558
683.3 3,644,560
3,644,561
683.43 3,644,565
826 3,644,566
829 3,644,567
835 3,644,568
3,644,569
845 3,644,570
857G 3,644,571
857R 3,644,572
860 3,644,573
873 3,644,574
876R 3,644,575
3,644,577
3,644,578
3,644,579
878B 3,644,583
878R 3,644,582
878 3,644,580
3,644,581
879R 3,644,588
879 3,644,584
3,644,585
880R 3,644,586
880 3,644,587
890 3,644,589
894 3,644,590
895 3,644,591
897C 3,644,576
897 3,644,592
900 3,644,593
901 3,644,594
920 3,644,595
922 3,644,596
933 3,644,597
936 3,644,598
951 3,644,599
959 3,644,600
972 3,644,601
974 3,644,602
978 3,644,603

**CLASS 261**

97 3,643,930
111 3,643,931

**CLASS 263**

21C 3,643,932
32 3,643,933

**CLASS 264**

.5 3,644,604
22 3,644,605
47 3,644,606
60 3,644,607
71 3,644,608
168 3,644,609
289 3,644,610
334 3,644,611

**CLASS 267**

155 3,643,934

**CLASS 269**

16 3,643,935
190 3,643,936
251 3,643,937
328 3,643,938

**CLASS 270**

1 Re.27,298

**CLASS 271**

62 3,643,939
76 3,643,940

**CLASS 272**

2 3,643,941
60 3,643,942
69 3,643,943

**CLASS 273**

34R 3,643,944
54C 3,643,945
85R 3,643,946
86E 3,643,947
97 3,643,948
101 3,643,949
105R 3,643,950
108 3,643,951
110 3,643,952
119A 3,643,954
119B 3,643,953
119R 3,643,955
130R 3,643,956
134AD 3,643,957
3,643,958
176FA 3,643,959
183B 3,643,960
197R 3,643,961

**CLASS 274**

4F 3,643,962
4J 3,643,963

**CLASS 277**

24 3,643,964
75 3,643,965
80 3,643,966
92 3,643,967
166 3,643,968

**CLASS 279**

4 3,643,969

**CLASS 280**

11.35T 3,643,977
28 3,643,978
3,643,979
41A 3,643,980
87R 3,643,981
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150AB 3,643,971
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475 3,643,975
478R 3,643,976

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53.5 3,643,988
189.36H 3,643,989

**CLASS 289**

1.5 3,643,990

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**CLASS 294**

19 3,643,991
65 3,643,992
73 3,643,993

**CLASS 296**

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**CLASS 297**

209 3,643,995
410 3,643,996
441 3,643,997

**CLASS 299**

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3,643,999
86 3,644,000

**CLASS 301**

38S 3,644,001
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**CLASS 302**

53 3,644,003

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10 3,644,744
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106 3,644,747
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252B 3,644,755
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37 3,644,005
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68 3,644,765
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174 3,644,772
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318 3,644,776

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696 3,644,817

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| 3,644,410 | 3,643,795 | 3,644,211 | 3,644,194 | 3,643,855 | 3,643,602 |
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| 3,643,306 | 3,643,869 | 3,644,487 | 3,643,840 | 3,644,582 | 3,643,698 |
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| 3,643,334 | 3,643,889 | 3,644,563 | 3,643,969 | 3,643,470 | 3,643,786 |
| 3,643,347 | 3,643,891 | 3,644,565 | 3,644,007 | 3,643,616 | 3,643,796 |
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| 3,643,570 | 3,643,950 | 3,644,681 | 3,644,289 | 3,644,830 | 3,643,954 |
| 3,643,583 | 3,643,977 | 3,644,684 | 3,644,327 | 3,644,843 | 3,643,955 |
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| 3,643,603 | 3,643,998 | 3,644,727 | 3,644,413 | 3,644,238 | 3,644,031 |
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| 3,643,660 | 3,644,039 | 3,644,809 | 3,644,569 | 3,644,919 | 3,644,113 |
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| 3,643,672 | 3,644,068 | 3,644,886 | 3,644,663 | 3,643,294 | 3,644,217 |
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| 3,643,716 | 3,644,160 | 3,644,929 | 3,644,742 | 3,643,397 | 3,644,332 |
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Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*